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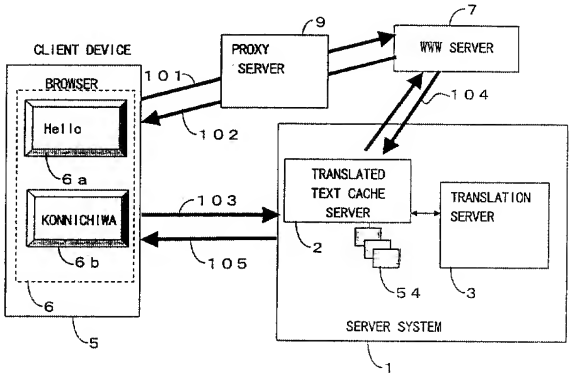
(54) Relay device, server device, terminal device, and translation server system utilizing these devices

(57) A translation server system of the present invention provides a function of translating a document without placing a load on a user's own terminal device. A relay device (2) for relaying request data from a terminal device (5) to a server device (7) and response data from the server device (7) to the terminal device (5) in response to the request data, includes a control unit (51) for performing communications with a translation server (3) for translating text information contained in the response data. The translation server (3) translates the text information contained in the response data received from the server device (7), and a result of this translation is transmitted as response data to the terminal device (5). The system may be applied to automated translation of E-mails delivered via the Internet.

FIG.1



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Description

[0001] The present invention relates to a translation server system.

[0002] With the spread of Internet technology typified by the World Wide Web (hereinafter abbreviated to WWW) and E-mail over recent years, a variety of information can be obtained without geographical restrictions. It has been proposed to reduce language barriers when exchanging information by combining the Internet with an automated translation program.

[0003] What is proposed in, e.g., Japanese Patent Application Laid Publication No.9-81549 is a system for readily translating the information obtained in a foreign language, formed by a combination of an auto translation program with a client system for accessing the WWW.

[0004] Further, Japanese Patent Application Laid-Open Publication No.10-149359 proposes a system for combining mail services with an auto translation system, and setting a language into which the E-mail is translated based on the addresses of a mail sender and receiver. According to this system, when receiving E-mail, the mail text is automatically translated based on the address of the sender.

[0005] In the system as disclosed in Japanese Patent Application Laid-Open Publication No.9-81549, however, the information obtained from the WWW is translated in the client terminal. This process puts a high load upon the CPU and requires some length of time for the translation. Hence, it is required in this system that the client terminal be provided with a high-performance computer. As a lot of client terminals are needed, it is difficult to actually introduce this type of system.

[0006] Moreover, handheld terminals are now coming into use as client terminals. It is not, however, realistic to utilize the auto translation system in the handheld terminal having a low processing power.

[0007] In addition, if the translation is performed by a client terminal, when a plurality of persons access the same information, each person needs to perform the translation, with the result that repetitive futile processes are executed in the system as a whole.

[0008] On the other hand, the system disclosed in Japanese Patent Application Laid-Open Publication No. 10-149359 aims at automatically translating the mail text on the basis of the addresses of the mail sender and receiver. Nowadays, however, a domain name, which may be defined as a mail address, is not necessarily classified according to the country. Hence, it is difficult to operate this system consistently in the present-day Internet environment, wherein the number of communication terminals increases more and more.

[0009] The present invention was devised in view of the problems inherent in the prior art described above, in order to allow translation of a document without placing a large processing burden upon a terminal device of a user.

[0010] An embodiment of the present invention employs a technology of translating document data communicated via a network by automatically judging whether the document data should be translated or not.

[0011] It is possible to decrease barriers in terms of languages used for exchanging the documents via the network by using the above technology.

[0012] According to one aspect of the present invention, a relay device for relaying request data from a terminal device to a server device and response data from the server device to the terminal device in response to the request data, comprises a translation unit for translating text information contained in the response data. The text information contained in the response data received from the server device is translated, and a result of this translation is transmitted as response data to the terminal device.

[0013] According to another aspect of the present invention, a relay device for relaying request data from a terminal device to a server device and response data from the server device to the terminal device in response to the request data, comprises a control unit for performing communications with a translation server for executing a translating process. Text information contained in the response data received from the server device is translated by the translation server, and a result of this translation is transmitted as response data to the terminal device.

[0014] The relay device may further comprise a caching unit for caching the translated result of the response data. The control unit, when the translated result of the response data given in response to the request data from the terminal device is cached in the caching unit, may transmit the translated result cached therein by way of response data to the request data to the terminal device.

[0015] The control unit, when receiving the request data from the terminal device, searches (checks) whether or not a translated version of the response data corresponding to the request is cached in the caching unit. If it is, the control unit responds to the terminal device by way of the translated response data.

[0016] On the other hand, if a translation of the response data is not cached in the caching unit, the control unit instructs the server device to transmit the response data and the server device translates the text information contained in the response data, thus responding to the terminal device.

[0017] According to still another aspect of the present invention, a terminal device connected to a network via a first relay device for relaying relay data as well as translating the same data, and a second relaying device for relay the relay data without translating the same data, comprises an information acquisition module for acquiring information from the network, a translation specification recognizing unit for recognizing whether the translation of the information is specified (i.e. requested) or not, and a routing unit for switching over the relay

device when accessing the network. When translation is required, the information translated by accessing the network from the first relay device is obtained, and otherwise the information that is not translated by accessing the network from the second relay device is obtained.

[0018] According to a further aspect of the present invention, a relay device for relaying data between an internal network in which a principal language for describing text information is prescribed, and an external network in which a category of the language for describing the text information is not limited, comprises a description language judging unit for judging the description language of the text information contained in the data to be relayed, and a translation unit for translating the text information. When the data from the external network are relayed to the internal network, the description language of the text information contained in the same data is translated into the principal language of the internal network.

[0019] According to a still further aspect of the present invention, a server device for executing transmitting/receiving services between a service receiving terminal in which a principal language for describing text information is prescribed, and an external communication device in which the language for describing the text information is not limited, comprises a description language judging unit for judging the description language of the text information contained in data to be received, and a translation unit for translating the text information. When receiving the data from the external communication device, the description language of the text information is translated into the principal language of the service receiving terminal.

[0020] According to a yet further aspect of the present invention, a server device for executing data transmitting/receiving services between a service receiving terminal and an external communication device, comprises a user information storage module for specifying a user of the service receiving terminal, a translating language by which text information contained in the data is translated, and a translated language into which the text information is translated, and a translation unit for translating the text information.

[0021] According to an additional aspect of the present invention, a terminal device connected via a network to a server device for translating text information into a language specified, comprises a document editing unit for editing document data having text information and display control information for the text information, and a transmitting/receiving unit for transmitting and receiving the text information to and from the server device. The server device is made to translate a part or the whole of the document data in the process of being edited into the language specified.

[0022] According to the present invention, there is also provided a program for making a machine (e.g. computer) function as each of the devices described above. The program may be stored on a machine-readable storage medium, in tangibly- or intangibly- recorded form.

[0023] As explained above, a principle of the present invention is that the relay device and the server device are made to translate the text information, and it is therefore possible to translate the document without any load on the terminal device.

[0024] Further, in one embodiment of the present invention, the relay device provided between the plurality of client devices and the server device is given the translating function, and hence there is no necessity of providing each client device with the translating function, whereby a consumption of resources of the client device can be reduced.

[0025] Moreover, in another embodiment of the present invention, the data translated in response to the request from one client device are retained and supplied upon request from other client devices. Therefore, this decreases the load upon the network by avoiding repetitive translating processes and reducing the number of data requests given to the server device.

[0026] In a further embodiment of the present invention, the server device is provided with the description language judging unit for judging the description language of the text information contained in the data, and hence it is feasible to translate document data received from an external network by automatically judging whether the document data should be translated or not.

[0027] Thus, according to the present invention, language barriers hindering the exchange of the documents via a network such as the Internet can be reduced.

[0028] Reference will now be made, by way of example only, to the accompanying drawings in which:

FIG. 1 is a diagram showing an architecture of a homepage translation system in a first embodiment of the present invention;

FIG. 2 is a diagram illustrating a hardware architecture of a translated text cache server and a client device;

FIG. 3 is a view showing a display screen of a browser;

FIG. 4 is a view showing an environment setting window 20 of the browser;

FIG. 5 is a diagram showing a caching method in the homepage translation system;

FIG. 6 is a flowchart (1) showing processes carried out by the client device;

FIG. 7 is a flowchart (2) showing the processes carried out by the client device;

FIG. 8 is a flowchart showing processes carried out by the translated text cache server;

FIG. 9 is a diagram showing an architecture of a mail translation system in a second embodiment of the present invention;

FIG. 10 is a flowchart showing processes carried

out by a translated mail server in the second embodiment of the present invention;
FIG. 11 is a flowchart showing a description language judging process of a mail text;
FIG. 12 is a flowchart showing a description language judging process of an appended document;
FIG. 13 is a flowchart showing the description language judging process;
FIG. 14 is a diagram showing an architecture of the mail translation system in a third embodiment of the present invention;
FIG. 15 is a diagram showing a data structure of a user table;
FIG. 16 is a flowchart showing a translating process in the third embodiment of the present invention;
FIG. 17 is a diagram showing an architecture of a translation system in a fourth embodiment of the present invention;
FIG. 18 is a diagram showing an architecture of the translation system in a fifth embodiment;
FIG. 19 is a view showing a display screen of a document edit application program;
FIG. 20 is a flowchart showing a document edit process;
FIG. 21 is a flowchart showing a partial text translating process; and
FIG. 22 is a flowchart showing a whole text translating process.

(First Embodiment)

[0029] A first embodiment of the present invention will now be discussed with reference to FIGS. 1 through 8.
[0030] FIG. 1 is a diagram showing an architecture of a homepage translation system in the first embodiment. FIG. 2 is a diagram illustrating a hardware architecture of a translated text cache server 2 and a client device 5 in FIG. 1. FIG. 3 is a view showing a display screen of a homepage browsing program (which will hereinafter be called a browser 6) executed by the client device 5. FIG. 4 is a view showing an environment setting window 20 of the browser 6. FIG. 5 is a diagram showing a caching method in this homepage translation system. FIGS. 6 and 7 are flowcharts each showing processes of a control program executed by the client device 5. FIG. 8 is a flowchart showing processes of a control program executed by the translated text cache server 2.

<Architecture>

[0031] FIG. 1 is the diagram showing the architecture of this homepage translation system. (Here, "homepage" refers to any kind of content available as web pages). This homepage translation system is constructed of the client device 5 (corresponding to a terminal device) for accessing the Internet (corresponding to an external network), a proxy server 9 for relaying an access from the client device 5 etc to the Internet, and a server system 1 connected via the network to the client device 5.
[0032] Further, the server system 1 is constructed of the translated text cache server 2 (corresponding to a relay device) and a translation server 3. The server system 1 (the translated text cache server 2) and the proxy server 9 according to the present invention, each incorporate a function of transmitting request data given from the client device 5 to a World Wide Web server (below abbreviated to WWW server) 7 on the Internet, and transmitting response data given from the WWW server 7 back to the client device 5.
[0033] The client device 5 is accessible to the WWW server 7 via the proxy server 9 or the translated text cache server 2.
[0034] FIG. 2 is a diagram showing the hardware architecture of the translated text cache server 2 and the client device 5.
[0035] The translated text cache server 2 includes a CPU 51 for executing the control program and an application program, a memory 52 for storing the control program etc executed by the CPU 51 and data processed by the CPU 51, a communication interface 53 for implementing communications by accessing the network, and a hard disk 54 for recording the data processed by the CPU 51.
[0036] The CPU 51 executes the control program stored in the memory 52, thereby acting as the translated text cache server 2.
[0037] The memory 52 stores the control program executed by the CPU 51 and the data processed by the CPU 51.
[0038] The communication interface 53, in response to a command from the CPU 51, forwards the communication data to the network. Further, the communication interface 53 receives the communication data from the network.
[0039] The hard disk 54 records the data processed by the CPU 51 and the data of which the processing has been completed.
[0040] The client device also includes a CPU 61, a memory 62, a communication interface 63 and a hard disk 64, which incorporate the same functions as those in the translated text cache server 2. In addition to these components, the client device 5 further includes a CRT 65 (corresponding to a display unit) for displaying the data to a user, a keyboard 66 used for the user to input the data, and a mouse 67 used for the user to operate menus and icons on the CRT 65.
[0041] The client device 5 shown in FIG. 1 executes the browser 6 (corresponding to an information acquisition module), thereby displaying a home page provided from the WWW server 7 on the CRT 65. Namely, the client device 5 establishes a connection with the WWW server 7 on the basis of Hypertext Transfer Protocol (which will hereinafter be abbreviated to http). In a state where this connection has been established, the client device 5 transmits a request 101 to the WWW server 7,

and obtains a response 102 from the WWW server 7.

[0042] This response 102 contains data, images, voices etc described by Hypertext Markup Language (HTML). The client device 5 displays these items of data on the CRT 65.

[0043] A characteristic function of this client device 5 is to display a result of translation of the homepage on the CRT 65 by the user performing a predetermined operation. The client device 5 accesses the WWW server 7 normally via the proxy server 9 (corresponding to a second relay device).

[0044] In the case of translating the homepage, the CPU 51 , which executes the browser 6 in the client device 5, transmits a request 103 to the translated text cache server 2 (corresponding to a first relay device) instead of transmitting the request 101 to the proxy server 9 (wherein the CPU 61 of the client device 5 that executes the browser 6 corresponds to a routing unit).

[0045] The translated text cache server 2 checks whether or not the result of translation of the homepage that has been requested 103, exists in the local hard disk 54.

[0046] If this piece of information does exist on the hard disk 54, the translated cache server 2 pads (copies) the result of translation into the response 105 and sends it back. In this instance, the hard disk 54 corresponds to a caching unit and will henceforth be simply called a cache.

[0047] If that piece of information does not exist on the hard disk 54, the translated text cache server 2 transmits the request to the WWW server 7 and receives as the response 104 the HTML data describing that homepage. Further, the translated text cache server 2 removes a tag (corresponding to display control information) of the HTML data, and reads text information. The translated text cache server 2 transmits this item of text information to the translation server 3 on the network. The translation server 3 translates the received text information and sends a translated result back to the translated text cache server 2.

[0048] The translated text cache server 2 embeds the received result of translation into the text information in the HTML data, and stores its result on the hard disk 54. Further, the translated text cache server 2 transmits the response 105 containing the HTML data into which this translated result is embedded, back to the client device 5.

[0049] The client device 5 receives the response 105 and displays this response 105 on a screen 6b of the browser 6. The homepage information provided from the WWW server 7 is thereby translated and displayed on the client device 5.

[0050] Thus, in a state where the translated homepage information is retained in the translated text cache server 2, when the request 103 for this homepage is issued to the translated text cache server 2, the translated text cache server 2 sends the response 105 containing the retained homepage information back to the client device which issued the request, without accessing the WWW server 7.

<Layout on Screen of Browser>

[0051] FIG. 3 shows the screen 6b displayed by the browser 6.

[0052] This browser 6 displays a display menu 11, a marking menu, an environment setting menu, a help menu and a homepage display area 14 on the screen 6b.

[0053] The display menu 11 contains selection items such as specification of "Source display", specification of "font" and "translation" 12. The user is able to display source data in the HTML format for describing the homepage by selecting "Source display". Further, the user is able to set a font of character data to be displayed by selecting "font". Moreover, the user is able to translate a sentence to be displayed in the homepage by selecting "translation" 12 (corresponding to an individual translation indicator).

[0054] The marking menu on the screen provides a function of storing an address (uniform resource locator or URL) of a homepage exhibiting a high access frequency.

[0055] The environment setting menu provides a function of setting a condition on which the browser 6 accesses the homepage on the network and a condition for displaying on the screen 6b etc. An environment setting window 20 in FIG. 4 is displayed by selecting the environment setting menu, and a current value is displayed therein. The user changes this setting and stores it, whereby the browser 6 can be made to perform a desired function.

[0056] A translation button 13 (corresponding to an individual translation indicator) provides a translation indicating function as by the translation 12 of the display menu 11. To be specific, when the user depresses the translation button 13, the text information of the homepage displayed is translated.

[0057] Now, English sentences and Japanese sentences are displayed in a "side-by-side translation mode". The side-by-side translation mode is a mode in which English sentences and Japanese sentences as a translation thereof are, as shown in FIG. 3, alternately displayed.

[0058] By the user's selection of the translation 12 of the display menu 11 or the depression of the translation button 13, the English screen and the translation screen (the screen in the side-by-side translation mode in FIG. 3) can be alternately switched.

<Environment Setting Window>

[0059] FIG. 4 shows a configuration of the environment setting window 20. This environment setting window 20 is, as explained above, displayed upon detecting the selection of the environment setting menu.

[0060] As shown in FIG. 4, the environment setting window 20 includes, sequentially from the upper area of the window, a homepage translation policy specifying field 21, a translated text display mode specifying field 22, a proxy server specifying field 23, a translated text cache server specifying field 24, a port number specifying field 25, an OK button 26 and a cancel button 27.

[0061] The homepage translation policy specifying field 21 specifies whether the translation of the homepage is executed automatically or manually. The homepage translation policy specifying field 21 is therefore provided with an auto translation button 21a (corresponding to an auto translation indicator) and a manual translation button 21b that are mutually exclusive.

[0062] When the homepage translation policy specifying field 21 is set in an auto mode (when the auto translation button 21a is switched ON), the homepage is automatically translated. In this setting, with a user operation on the screen, the request 103 is always sent to the translated text cache server 2 instead of the request 101 being transmitted to the proxy server 9. Namely, the information on the homepage is always available via the translated text cache server 2.

[0063] On the other hand, if the homepage translation policy specifying field 21 is set in a manual mode (when the manual translation button 21b is switched ON), the browser 6 sends the request 101 to the WWW server 7 via the proxy server 9. Therefore, the browser 6 normally displays the original homepage information contained in the response 102. If the client device 5 detects the user's selection of the translation 12 of the display menu 11 or the user depression of the translation button 13 during the above display, the client device 5 sends the request 103 containing the URL (corresponding to an identifier) of the homepage displayed to the translated text cache server 2. Consequently, in the same way as the above, the response 105 containing the translated homepage information is sent back from the translated cache server 2 and displayed in the homepage display area 14.

[0064] The translated text display mode specifying field 22 provides a function of changing a display mode of displaying the translation of the homepage. This translated text display mode includes three modes such as a whole-sentence translation display mode, a side-by-side (alternate line) translation display mode and a 2-screen display mode.

[0065] The whole-sentence translation display mode is a mode in which full sentences of the homepage in English version are translated into Japanese sentences. That is, the original text of the text information contained in the original homepage is replaced with the translated texts, and the homepage is thus displayed.

[0066] The side-by-side translation display mode is on in which the text information is segmented into phrases, and both of the original text and the translated text are successively displayed on the homepage. FIG. 3 shows one example of the side-by-side translation display in the homepage display area 14.

[0067] The 2-screen display mode is a mode of displaying two screens for the original homepage and the homepage in the translated version. That is, the translated version is shown at another side or part of the display opposite the original text.

<Caching Method>

[0068] FIG. 5 shows an outline of the caching method in the homepage translation system. As shown in FIG. 5, in this homepage translation system, a proxy server 2a functions as the translated text cache server 2. To be more specific, the proxy server 2a, when receiving requests 103a, 103b from client devices 5a, 5b etc and relaying the requests checks whether the translation corresponding to each request is already present in the cache.

[0069] If the translated result is already present, the proxy server 2a requests neither the WWW server 7 for relaying nor the translation server 3 for translating, and responds to the client device 5a etc with the translation from the cache.

[0070] In this process, caching based on URL may be appropriate. That is, the information of the translated homepage is cached in an address on the hard disk 54 that is based on the URL specified by the request 103a etc. Whenever a request for that homepage is given again, the hard disk 54 (the cache) may be searched inside based on the URL. In this process, the URL is referred to as a key of the cache.

[0071] As discussed above, however, in accordance with the first embodiment, the whole-sentence translation display mode, the side-by-side translation display mode and the 2-screen display mode are provided as translation display modes (also referred to as translation modes). Therefore, if the cache is accessed simply using the URL of the homepage, it is impossible to distinguish between those three display modes.

[0072] Accordingly, it is assumed that a first client device 5a set in, e.g., the whole-sentence translation display mode makes the request 103a for the homepage located by a URL such as **http://abcd.com**, and that the contents of that homepage are retained in the cache in the whole-sentence translation display mode. Next, it is presumed that another client device 5b set in the side-by-side translation display mode issues the request 103b for the same homepage.

[0073] In this case, the proxy server 2a is unable to distinguish between the homepage displayed in the whole-sentence translation display mode and the homepage displayed in the side-by-side translation display mode from their URLs. Hence, the information of the homepage displayed in the whole-sentence translation display mode hits the request 103b on the cache, which is issued from the client device 5b set in the side-by-side translation display mode. As a result, the homepage in the whole-sentence translation display

mode is displayed on the client device 5b set in the side-by-side translation display mode.

[0074] To avoid this problem, in an embodiment of the present invention, a piece of information for specifying the translated text display mode is added to the tail of the URL. For instance, a URL such as **http://abcd.com/AsAWhole** is specified for the request 103a given from the client device 5a set in the whole-sentence translation display mode.

[0075] The proxy server 2a searches based on this URL, to find out whether or not the homepage specified by **http://abcd.com** is cached in the whole-sentence translation display mode. If this search is hit on the cache, the proxy server 2a transmits the information of that homepage back.

[0076] The proxy server 2a, if not hit on the cache, generates a request 103c with **http://abcd.com** specified as the URL by eliminating the character string, i.e., AsAWhole padded at the tail, and sends this request to the WWW server 7. Next, the proxy server 2a makes the translation server 3 translate the text information contained in the HTML data obtained as a response thereto. Subsequently, the proxy server 2a modifies the HTML data in the whole-sentence translation display mode by use of the translated result, and retains the modified data in the cache, wherein URL such as **http://abcd.com/AsAWhole** is used as a key. Finally, the proxy sever 2a sends the modified HTML data back to the client device 5a.

[0077] On the other hand, a URL such as **http://abcd.com/SideBySide** is specified for the request 103b given from the client device 5b set in the side-by-side translation display mode. The proxy server 2a searches the cache based on this URL to see whether or not the homepage specified by **http://abcd.com** is cached in the side-by-side translation display mode. If this search is hit on the cache, the proxy server 2a transmits the information of that homepage back. Otherwise, the proxy server 2a makes the request 103c to the WWW server 7 and a request to the translation server, modifies the received HTML data, stores the data in the cache (with the URL of **http://abcd.com/sideByside** serving as a key in this case), and sends the response 103b back.

<Function and Effect>

[0078] FIGS. 6 and 7 are flowcharts each showing processes carried out by the client device 5. FIG. 8 is also a flowchart showing processes carried out by the translated text cache server 2. The client device 5 and the translated text cache server 2 execute these processes, thereby acting as the homepage translation system.

[0079] As shown in FIG. 6, the client device 5 executes the browser 6 in the CPU 51, and waits for an input of a URL from the user (S1). Note that immediately after the browser 6 has been executed, the client device 5 displays an initial homepage.

[0080] In the process S1, upon detection of the input of a URL from the user, the client device 5 judges whether or not the auto translation button 21a is ON (S2).

[0081] If the auto translation button 21a is ON, the client device 5 executes a translated text acquiring process (S3), whereas if the auto translation button 21a is not ON (while the manual translation button 21b is ON), the client device 5 obtains the original HTML data (S4).

[0082] Next, the client device 5 displays the homepage as the original or translated version (S5).

[0083] FIG. 7 is a flowchart showing details of the translated text acquiring process (S3 in FIG. 6). In this process, the client device 5 obtains the translated text of the HTML data that describe the homepage.

[0084] To start with, the client device 5 switches over the proxy server to the translated text cache server 2 from what is normal (S30).

[0085] Next, the client device 5 judges whether or not the translated text display mode is the side-by-side translation display mode or the whole-sentence translation display mode (S31). When the translated text display mode is the whole-sentence translation display mode, the client device 5 adds the indication (AsAWhole) of the whole-sentence translation display mode to the URL specified by the user (S32).

[0086] On the other hand, when the translated text display mode is the side-by-side translation display mode, the client device 5 adds the indication (SideBySide) of the side-by-side translation display mode to the URL specified by the user (S33).

[0087] Next, the client device 5 specifies the URL and transmits the request to the translated text cache server 2 (S34). The client device 5, in this state, waits for a response from the translated text cache server 2 (S35).

[0088] If given no response, (NO in the judgement in S36), it is confirmed whether or not the unillustrated cancel button is depressed (S37). If so (YES in the judgement in S37), the client device 5 finishes the processing. Otherwise, (NO in the judgement in S37), the client device 5 goes back to the wait-for-the-response state (S35).

[0089] On receipt of the response, the client device 5 judges whether the translated text display mode is the 2-screen display mode or not (S38). In the case of the 2-screen display mode, the client device 5 starts a browser 6b for displaying the translated text (S39), and comes to an end of the translated text acquiring process.

[0090] If the translated text display mode is not the 2-screen display mode, the client device 5 directly finishes the translated text acquiring process.

[0091] FIG. 8 is a flowchart showing processes carried out by the translated text cache server 2.

[0092] To begin with, the translated text cache server 2 receives the request (S11). Next, the translated text cache server 2 judges whether or not the HTML data corresponding to the URL specified in that request exist in the cache (S12); if so, the translated text cache server

2 obtains a translated result from the cache (S20), and sends a response back (S21). If not, the translated text cache server 2 removes the indication (AsAWhole or SideBySide) of the translated text display mode out of the URL, and obtains an HTML file from the WWW server 7 (S13).

[0093] Next, the translated text cache server 2 judges whether or not the translated text display mode is the side-by-side translation display mode or the whole-sentence translation display mode (S14). If the former, the translated text cache server 2 notifies the translation server 3 of a side-by-side translation (S15).

[0094] If the translation display mode is the whole-sentence translation display mode, the translated text cache server 2 notifies the translation server 3 of a whole-sentence translation (S16).

[0095] Next, the translated text cache server 2 requests the translation server 3 to translate the sentence (S17). Subsequently, the translated text cache server 2 obtains a translated result from the translation server 3 (S18).

[0096] Next, the translated text cache server 2 stores the translated result in the cache (S19). At this time, the URL with the indication (AsAWhole or SideBySide) of the translated text display mode is used as a key for searching the cache.

[0097] Subsequently, the translated text cache server 2 sends the response back because of having obtained the translated result (S21), and comes to an end of processing.

[0098] As discussed above, according to the homepage translation system in the first embodiment, the translated text cache server 2 retains the translated result, and hence, when the same homepage is accessed a plurality of times, the display of the translated homepage is speeded up. Further, when a plurality of client devices 5 access the same homepage, it never happens that the translation of the same homepage is repeated.

[0099] Moreover, in the first embodiment, the translation server 3 on the network executes the translation. Accordingly, the translation can be implemented irrespective of the resources available to the client device 5 (a capacity of the memory 62, a performance of the CPU 61, and so on). Thus, even if the client device 5 is a handheld terminal or cellular phone of limited capabilities, the translation is executed at a high speed.

[0100] Further, the client device 5 in the first embodiment is provided with the side-by-side translation display mode, the whole-sentence translation mode, etc as translated text display modes. The character string for specifying the translated text display mode is added to the tail of the URL, then transmitted to the translated text cache server 2, and thus used as the key for searching the cache. As a result, even when the indications of the whole-sentence translation display mode and of the side-by-side translation display mode are transmitted to the same translated text cache server 2, it is feasible to translate the homepage with the distinction between these display modes, store the translated result in the cache and read it from the cache.

[0101] Thus, the translated result corresponding to the mode is cached, thereby making it possible to generate the response data to the client device at a higher speed than by diverting (converting) the translated result from another mode. The diversion of the translated result in another mode implies caching the translated result in the other mode and processing it into a content corresponding to the specified mode.

[0102] Further, in the first embodiment, whether the homepage is to be translated or not is selected by switching over the proxy server for transmitting the request from the client device 5. Therefore, owing to the addition of the translated text cache server 2, the translation system on the network can be configured without affecting the conventional network.

[0103] Moreover, unnecessary translating processes can be reduced by not always translating the data obtained from the WWW server 7 but by executing only those translating processes indicated (via the manual translation setting) by the user, thereby decreasing the processing load on the translation of the homepage.

<Modified Example of Language for Describing Homepage>

[0104] The homepage is described by HTML in the first embodiment. The embodiment of the present invention is not, however, limited to this. For example, the present invention can be embodied in a case where the homepage is described by XML (eXtensible Markup Language) into which HTML is incorporated. Moreover, the present invention can be also applied to a case where a homepage is described by a subset of HTML.

<Change of Server>

[0105] The translated text cache server 2 and the translation server 3 are actualized by use of different proxy servers in the first embodiment. The embodiment of the present invention is not, however, confined to this architecture. For instance, the translated text cache server 2 and the translation server 3 may be provided by one and the same proxy server.

[0106] Note that the above server function is preferably actualized by the proxy server as demonstrated in the embodiment discussed above, however, the present invention is not necessarily limited to this method. That is, the processes of the translated text cache server 2 shown in FIG. 8 are executed in a relay device (incorporating the communicating function) such as a router, bridge and hub on the network, which serve to connect the client device 5 to the WWW server 7, whereby the present invention can be embodied.

[0107] Further, there is no necessity of newly providing the translation server 3, and an existing translation

service may also be utilized. The existing translation service is such that when the original text is transmitted by way of E-mail to a predetermined address, the translation server executes the translating process and transmits its translated text back to the sender. For example, the translated text cache server 2 extracts text information from the HTML data and E-mails it to an address specified in the translation service, and the translated text to be sent back may be received and utilized for the processing according to the present invention.

<Modified Example of Cache>

[0108] The translated text cache server 2 involves the use of the hard disk 54 as the cache in the first embodiment, but for instance, a semiconductor memory such as a DRAM (Dynamic Random Access Memory), or an SRAM (Static Random Access Memory) may also be used as a cache.

[0109] Obviously, mode indications added to URLs are not restricted to any particular character string (AsAWhole or SideBySide).

<Auto Judgement of Description Language>

[0110] In the first embodiment, when the user indicates the auto or manual translation, the request is transmitted to the translated text cache server 2. The translated text cache server 2 obtains the HTML data from the WWW server 7, and the translation server 3 is made to translate the HTML data.

[0111] It may also be automatically judged whether or not the HTML data obtained by the translated text cache server 2 need to be translated.

[0112] The translated text cache server 2 is actualized by the proxy server in the first embodiment. Accordingly, the translated text cache server 2 belongs to a predetermined internal network (which is known as a domain) provided with access proxy services to the Internet. It may be considered that there is substantially one category of language used for describing the text information in the client device 5 etc within this domain. This language is called a principal language.

[0113] The translated text cache server 2 checks the description language of the HTML data to be relayed to within the domain, and, if this description language is different from the principal language, instructs the translation server to translate it.

[0114] A method of judging the description language of the text information may be such that if, for instance, a predetermined or larger number of 2-byte hiragana (Japanese phonetic syllables) or katakana (angular Japanese phonetic syllables) are detected in the text information, the language may be judged to be Japanese. Further, if a predetermined or larger number of "the" as a 1-byte character string are detected in the text information, the text information concerned may be judged to be English.

[0115] If these elements are mixed, there are counted the number of 2-byte hiragana or katakana in the text information and the number of 1-byte English letters in the text information, and a judgement may be made corresponding to quantities of those letters.

[0116] According to the principal language judging method, the judgement might encounter different languages (English and French) with respect to the 1-byte system, and Japanese and the Hunkul alphabet even in the same code system (1-byte notation/2-byte notation). Therefore, if a word or character code characteristic of the principal language is used for the judgment, it is feasible to enhance accuracy.

[0117] The translated text cache server 2 may judge the number of the characters and the number of character strings described above from the whole of the HTML data received. Alternatively, it may be judged from a predetermined part of the HTML data described above.

[0118] Further, the description language may also be judged by use of a piece of character code set information contained in a header of the HTML data received from the WWW server 7.

[0119] The above-mentioned auto judgement of the description language is not limited to the case where Japanese is used as the principal language, and the data described in English are translated. Namely, the present invention can be, as a matter of course, applied irrespective of the translation target language (the original language) and the principal language (the translated language).

<Readable-by-Computer Recording Medium>

[0120] The program shown in the first embodiment can be recorded on a readable-by-computer recording medium. Then, a computer reads and executes the control program on this recording medium, whereby the computer can function as the translated text cache server 2 or the client device 5 shown in the first embodiment.

[0121] Herein, the readable-by-computer recording medium embraces recording meda capable of storing information such as data, programs, etc. electrically, magnetically, optically and mechanically or by chemical action, which can be all read by the computer. Among such recording media, various removable types may be employed such as e.g., a floppy disk, a magneto-optic disk, a CD-ROM, a CD-R/W, a DVD, a DAT, an 8mm tape, a memory card, etc.

[0122] Further, a hard disk, a ROM (Read Only Memory) and so on are classified as fixed type recording media within the computer.

<Data Communication Signal Embodied in Carrier Wave>

[0123] Furthermore, the control program may be stored in the hard disk and the memory of a computer,

and downloaded to other computers via communication media. In this case, the program is typically transmitted as data communication signals embodied in carrier waves via the communication media. Then, the computer downloaded with this program can be made to function as the translated text cache server 2 or the client device 5 as in the first embodiment.

[0124] Herein, the communication media may be any one of cable communication media (such as metallic cables including a coaxial cable and a twisted pair cable, or an optical communication cable), and wireless communication media (such as satellite communications, ground wave wireless communications, etc.).

[0125] Further, the carrier waves are electromagnetic waves for modulation with the data communication signals, or light. The carrier waves may, however, be DC signals (in this case, the data communication signal a base band waveform with no carrier wave). Accordingly, the data communication signal embodied in the carrier wave may be any one of a modulated broadband waveform and an unmodulated base band signal (which corresponds to a case of setting a DC signal having a voltage of 0 as a carrier wave).

(Second Embodiment)

[0126] A second embodiment of the present invention will be explained by referring to FIGS. 9 through 13. FIG. 9 is a diagram showing an architecture of a mail translation system in the second embodiment. FIGS. 10 to 13 are flowcharts each showing processes of a control program executed by a CPU 51 of a translated mail server 32 shown in FIG. 9.

[0127] The homepage translation system has been described in the first embodiment. The second embodiment will exemplify a system for translating mail (E-mail messages) instead of a homepage (web content). The components and functions other than what is related to the mail are the same as those in the first embodiment. The same components are marked with the like numerals, of which the repetitive explanations are omitted. Further, as the necessity may arise, the drawings in FIGS. 1 through 8 are referred to.

<Architecture>

[0128] FIG. 9 is a diagram showing the architecture of the mail translation system. The mail translation system is constructed of a mail server 31 (corresponding to a server device) for managing a mailbox 55, a client device 5 (corresponding to a service receiving terminal) for receiving mail sent from the mail server 31, and a server system 1 for translating the mail in the mailbox 55. Further, the server system 1 comprises the translated mail server 32 and the translation server 33 that are connected on the network.

[0129] The mail server 31 receives an item of mail 111 from another country, and drops the mail 111 into the mailbox 55. Further, the client device 5 accesses the mail server 31 and checks whether any mail has arrived. Then, the client device 5, if there is mail that is not yet received, downloads it (115). Further, the mail server 31, in response to a request given from the client device 5, delivers an item of mail 116 created by the client device 5 to the external network (117).

[0130] The client device 5 provides a user interface. Namely, the client device 5 provides a tool for displaying the received mail on an unillustrated screen and editing mail to be sent by the user.

[0131] A hardware architecture of the translated mail server 32 is the same as that of the translated text cache server 2 in the first embodiment (see FIG. 2). The translated mail server 32 monitors the mailbox 55. The translated mail server 32, when discovering fresh mail in the mailbox 55, locks this mail in order to forbid access from other devices. Moreover, the translated mail server 32 reads that fresh mail and determines the mail description language. If the description language is English, the translated mail server 32 transfers the fresh mail to the translation server 33 and request the server 33 to translate it.

[0132] The translated mail server 32, upon receiving a translated result from the translation server 33, replaces the text of the fresh mail locked in the mailbox 55 with the translated result. Further, the translated mail server 32 unlocks the fresh mail, whereby the client device 5 can receive the mail after it has been translated.

<Function and Effect>

[0133] FIGS. 10 through 13 are the flowcharts showing the control program executed by the translated mail server 32.

[0134] The translated mail server 32 normally monitors the mailbox (S100). If no fresh mail exists (NO in the judgement in S100), the translated mail server 32 sets the control back to the monitoring of the fresh mail.

[0135] If fresh mail exists (YES in S100), the translated mail server 32 locks it (S101) to prevent the client device 5 etc from reading it before or midway through translation.

[0136] Next, the translated mail server 32 executes a description language judging process of the mail text (S102). Note that the mail consists of a control element indicating a destination and a sender, a mail text defined as text information, and an appended document sent as an appendix to the mail text in the second embodiment.

[0137] If the mail text is English (YES in the judgement in S103), the translated mail server 32 requests the translation server 33 to translate the mail text (S104). On receipt of a result of the translation by the translation server 33 back to the translated mail server 32, the translated mail server 32 replaces the mail text locked within the mailbox with the translated result. Next, the translated mail server 32 passes the control to a judgement in S105.

[0138] If the mail text is Japanese (NO in the judgement in S103), the translated mail server 32 passes the control to the judgement in S105.

[0139] The translated mail server 32 judges in S105 whether or not an appended document exists (S105). If no appended document exists (NO in the judgement in S105), the translated mail server 32 advances the control to a process in S109. On the other hand, if an appended document exists (YES in the judgement in S105), the translated mail server 32 executes a description language judging process of the appended document (S106) (the CPU 51 of the translated mail server 32, which executes the processes in S102 and S106, i. e., the description language judging process, corresponds to a description language judging unit).

[0140] The information on whether an appended document exists, a file name of the appended document and an appended document coding method carried out on the transmitting side, are described in the control element (header information) of the mail. Separate information for indicating a data part of the appended document is described in the mail text. Hence, the existence of the appended document can be judged from the control element (header information) of the mail. Accordingly, if the appended document exists, the appended document file can be restored from the coded data in the mail text, which are specified by the separate information, by a decoding process corresponding to the coding method on the transmitting side.

[0141] As a result of judging the description language, if the appended document is not English (it is Japanese), the translated mail server 32 advances the control to a process in S109.

[0142] If the appended document is English, the translated mail server 32 translates the appended document (S108). In this case, the translated mail server 32 reads the text information from the appended document. Note that the translated mail server 32 is capable of judging from an extension given to the file name of the appended document which application the document is used in, and makes an analysis corresponding to a document format thereof, thus reading the text information.

[0143] Next, the translated mail server 32 requests the translation server 33 to translate the read-out text information. When sending the result of the translation by the translation server 33 back to the translated mail server 32, the translated mail server 32 replaces the text information of the appended document with the translated result. The translated appended document is thereby created. The translated mail server 32 further replaces the appended document in the mailbox with the translated appended document. Thereafter, the translated mail server 32 advances the control to the process in S109.

[0144] In the process in S109, the translated mail server 32 unlocks the fresh mail and returns to the monitoring of fresh mail (S100).

[0145] It may be taken for granted that the monitoring process of the fresh mail and the translating process in FIG. 10 are executed in parallel, and that it is possible to process a plurality of items of mail in parallel.

[0146] FIG. 11 is a flowchart showing the description language judging process of the mail text. In this process, the translated mail server 32, to start with, reads the mail text (S1021). Next, the translated mail server 32 executes the description language judging process (S1022). Thereafter, the translated mail server 32 finishes the description language judging process of the mail text.

[0147] FIG. 12 is a flowchart showing the description language judging process of the appended document. In this process, the translated mail server 32 first removes the control information out of the appended document (S1061). The appended document may be pure text information or it may be binary information created by a word processor, a spreadsheet program or a presentation document creation tool. In either case, the text information is extracted out of the appended document.

[0148] Next, the translated mail server 32 executes a description language judging process with respect to the extracted text information (S1062). Thereafter, the translated mail server 32 finishes the description language judging process of the appended document.

[0149] FIG. 13 is a flowchart showing the description language judging process. In this process, the description language of the text information is judged.

[0150] To begin with, the translated mail server 32 counts the number of character strings "**the**" contained in the text information (S110). In this process, the translated mail server 32 deems the text information as 1-byte ASCII character strings, and counts the number of 3-byte strings corresponding to "**the**" therein. The reason why the existence of the character string "**the**" is checked as a judgement criterion for the description language, is that a use frequency of "**the**" is high in the English language and "**the**" does not exist in other languages such as French, German and so on.

[0151] Next, the translated mail server 32 counts the number of characters of 2-byte hiragana or katakana contained in the text information (S111). In this process, the translated mail server 32 treats the text information as combinations of 1-byte characters and 2-byte characters, and counts the number of byte strings corresponding to hiragana or katakana therein.

[0152] Next, the translated mail server 32 judges whether or not one or more character strings "**the**" exist in the text information (S112).

[0153] If one or more character strings "**the**" do not exist in the text information, the translated mail server 32 judges whether or not hiragana or katakana exists in the text information (S113).

[0154] If it is judged in S113 that neither hiragana nor katakana exists in the text information, the translated mail server 32 presumes that the language judgement is impossible (S114), and finishes the description lan-

guage judging process.

[0155] If it is judged in S113 that either hiragana or katakana exists in the text information, the translated mail server 32 presumes that the description language is Japanese(S115), and finishes the description language judging process.

[0156] On the other hand, if it is judged in S112 that one or more character strings "**the**" exist therein, the translated mail server 32 further judges whether or not hiragana or katakana exists in the text information (S116). This process takes account of an English-Japanese mixture.

[0157] If S116 determines that neither hiragana nor katakana is present, the translated mail server 32 presumes that the description language is English (S117), and finishes the description language judging process.

[0158] If it is judged in S116 that hiragana or katakana exists, the translated mail server 32 compares the number of English letters with the number of kana characters (S118). If the number of English letters is greater than the number of kana characters (YES in the judgement in S119), the translated mail server 32 assumes that the description language is English (S120), and finishes the description language judging process.

[0159] If the number of kana characters is larger than the number of English letters (NO in the judgement in S119), the translated mail server 32 assumes that the description language is Japanese (S121), and finishes the description language judging process.

[0160] As discussed above, the mail translation system in the second embodiment automatically judges the description language of the fresh mail text or of an appended document. Then, if the description language is English (or any language different from Japanese), this mail translation system automatically translates it. Accordingly, the user who receives the mail has no necessity of manually requesting a translation from the translation system. Therefore, the present mail auto translation system is effective especially in an environment where numerous E-mails are received from abroad.

[0161] Moreover, the translated mail server 32 reads the fresh mail arriving at the mailbox and executes the translation of the mail. Hence, the translation can be implemented irrespective of the resources available to the client device 5(such as the capacity of the memory 62 and the performance of the CPU 61).

[0162] Moreover, the translated mail server 32 in the second embodiment distinguishes between English and Japanese on the basis of the number of character strings "**the**", i.e., the number of 2-byte hiragana or katakana characters in the text information. Since a simple character string is used for the judgement, the translated mail server 32 does not need to retain a special dictionary. Consequently, the storage capacity (capacities of the memory 62 and of the hard disk 64) of the translated mail server 32 can be reduced.

<Modified Example>

[0163] The mail translation system in the second embodiment translates E-mails from abroad (e.g. in English) into the local language (e.g. Japanese). The embodiment of the present invention is not, however, limited to this translation mode. For example, in a Japanese company's overseas branch office in an area where English is the official language, or in a U.S.A-or U.K-based Japanese company where English is the official language in the office, a Japanese-written mail arrived there may also be translated into English. The translated mail server 32 may store in the memory 52 or the hard disk 54 the description language (the principal language) of the document used in the service receiving terminal such as the client device 5 etc. Then, the translated mail server 32 may instruct the translation server 33 to translate it into the description language. Further, the translation server 33 may also retain E-mails in their principal language.

[0164] In the second embodiment discussed above, electronic mail is automatically translated by judging whether the mail description language is English or Japanese. The embodiment of the present invention is not, however, confined to E-mails in English and Japanese. For instance, the number of the definite articles "**1a**" or "**1e**" in French may be counted in place of "**the**" to judge whether the description language is French or not. Incoming mail in French may also be thus automatically translated. Furthermore, the number of umlaut letters peculiar to German or the number of the definite articles "**die**" can be counted, thereby determining whether the description language is German or not. E-mails in German may also be thus automatically translated.

[0165] In this case, the judgement might encounter different languages even in the same code system (1-byte notation/2-byte notation). For example, English and French may be exemplified as a 1-byte system, and Japanese and the Hunkul alphabet may be exemplified as a 2-byte system. Such being the case, if whether or not there are a word and a character code used in only the principal language is set as a judgment condition, it is feasible to enhance accuracy of the judgment.

[0166] Further, instead of counting the number of hiragana or katakana characters, the number of Hunkul alphabets (characters) may be counted, thereby judging whether the description language is Hunkul or not. E-mails in Hunkul may also be thus automatically translated. As described above, the embodiment of the present invention is not limited to any specific mail description language.

[0167] In the above example, the mail description language was judged from the counted result of the whole text information contained in the mail. Instead, the description language may also be judged based on a counted result of a specified part, e.g., a head 20-byte mail text of the text information of the mail.

[0168] Moreover, there is no necessity of newly pro-

viding the translation server 33, and an existing translation service can be utilized. An example of an existing translation service is one where the original text is transmitted by way of E-mail to a predetermined address, the translation server executes the translating process and transmits its translated text back to the sender. For example, the translated mail server 32 extracts the text information of the E-mail and again transmits the text information of the E-mail to an address specified in the translation service, and the translated text to be sent back may be received and utilized for the processing according to the present invention.

(Third Embodiment)

[0169] A mail translation system in a third embodiment of the present invention will be explained by referring to FIGS. 14 to 16. FIG. 14 is a diagram showing an architecture of this mail translation system. FIG. 15 is a diagram showing a data structure in a user table 34 to which the translated mail server 32 shown in FIG. 14 refers. FIG. 16 is a flowchart showing processes of a control program executed by the translated mail server 32.

[0170] The mail translation system demonstrated in the second embodiment detects the arrival of new E-mail in the mailbox, and, if the description language thereof is English, automatically translates the mail into Japanese.

[0171] In accordance with the third embodiment, there will be explained a mail translation system for translating a mail in accordance with a user table 34 (corresponding to a user information storage module) registering couples (pairs) of mail senders and receivers instead of judging the description language. Other components and functions are the same as those in the second embodiment. The same components are marked with the like numerals, of which the repetitive explanations are omitted. Further, as the necessity may arise, the drawings in FIGS. 1 through 13 are referred to.

<Architecture>

[0172] FIG. 14 is the diagram showing the architecture of this mail translation system. This mail translation system is substantially the same as the system in the second embodiment, except that the translated mail server 32 is provided with the user table 34. Note that a functional difference from the second embodiment is that this mail translation system automatically translates both arriving and outgoing (delivered) E-mails.

[0173] FIG. 15 is the diagram showing the data structure in the user table 34. In the user table 34, a direction of the translation is defined for each sender/receiver pair.

[0174] As shown in FIG. 15, this table consists of records each composed of fields such as Registration No., Sender, Receiver and Direction of Translation.

[0175] Registration No. is a serial number of the record registered.

[0176] An address of the mail sender is specified in the field "Sender". On the other hand, an address of the mail receiver is described in the field "Receiver".

[0177] The field "Direction of Translation" specifies which direction, such as Japanese-English or English-Japanese, the translation is executed in. For instance, the direction of Japanese-English specifies that Japanese is translated into English.

[0178] The user table is filled with a multiplicity of records described above, thereby specifying necessities and directions of the translations of the various E-mails (delivered and received) that may exist in the mailbox.

[0179] For example, in a record with Registration No. 1 in FIG. 15, English-Japanese is specified as the direction of translation with respect to a couple of Sender ALL and Receiver **skasai@aaa.co.jp.** In this case, all E-mails addressed to Receiver **skasai@aaa.co.jp** are translated from English into Japanese.

[0180] Further, in a record with Registration No.2, Japanese-English is specified with respect to a couple of Sender **skasai@aaa.co.jp** and Receiver **jack@bbb.com**.

[0181] Thus, the mail translation system in the third embodiment automatically executes the translation in accordance with the user table 34 regardless of whether it is the delivered mail or the received mail.

<Function and Effect>

[0182] FIG. 16 is a flowchart showing the translating process in the third embodiment. The mail server 33, the translated mail server 32 and the translation server 33 shown in FIG. 14 execute respective control programs, thereby attaining the processes in FIG. 16.

[0183] To begin with, in the mail translation system, the translated mail server 32 monitors the mailbox, and detects that new mail has arrived at the mail server 31 (S200).

[0184] Next, the translated mail server 32 extracts a sender and receiver of this mail out of the control information (S201).

[0185] Subsequently, the translated mail server 32 searches the user table 34 (S202) and judges whether or not the extracted sender and receiver are registered as a couple in the user table 34 (S203).

[0186] If this couple of the sender and receiver does not exist in the user table 34, the translated mail server 32 does nothing, and makes the mail server execute a process in S210.

[0187] If this couple of the sender and receiver exists in the user table 34, the translated mail server 32 obtains a direction of the translation from the user table 34 (S204).

[0188] Next, the translated mail server 32 checks a description language of the mail text (S205). This proc-

ess is the same as what is shown in FIGS. 11 and 13, and hence its explanation is omitted.

[0189] Subsequently, the translated mail server 32 judges based on the description language of the mail text and the direction of the translation in the user table 34 whether that mail is a target for translation or not (S206). For instance, when the description language of the mail text is English, and when the direction of the translation is English-Japanese, this mail is judged to be the translation target. If the mail is not a translation target (NO in the judgement in S206), the translated mail server 32 executes nothing, and makes the mail server execute a process in S210.

[0190] If the mail is a translation target (YES in the judgement in S206), the translated mail server 32 requests the translation server 33 to translate the mail text (S207).

[0191] Next, the translated mail server 32, based on the translated result, creates a translated mail by replacing the mail text with the translated result. Then, the translated mail server 32 registers the translated mail in the mailbox (S208). Thereafter, the translated mail server 32 finishes the processing of this mail.

[0192] After the processing by the translated mail server 32, the mail server 31 transmits the translated mail to the mail receiver (S209).

[0193] Next, the mail server 31 transmits the mail as the original to the receiver (S210). With the processing thus done, the mail auto translation and the sending process are carried out.

[0194] As described above, the mail translation system judges based on the definitions in the user table 34 and the description language whether each item of mail is a translation target or not, and determines the direction of the translation. Therefore, a mail translation system flexible enough not to cause any error in terms of the direction of the translation, can be configured.

<Modified Example>

[0195] The embodiment discussed above has exemplified a mail translation system for executing the Japanese-English or English-Japanese translation. The embodiment of the present invention is not, however, confined to any particular description language or translation direction of the mail. For example, Japanese-Hunkul, Hunkul-Japanese, Japanese-German, German-Japanese, Japanese-French, French-Japanese etc may also be specified as directions of the translation. Accordingly, any arbitrary language supported by the translation server may be set as a translation target in the present mail translation system.

[0196] Further, there is no necessity of newly providing the translation server 33, and an existing translation service can be also utilized. This existing translation service is one in which the original text is transmitted by way of E-mail to a predetermined address, the translation server executes the translating process and transmits its translated text back to the sender. For example, the translated mail server 32 extracts the text information of the E-mail and transmits the text information of the E-mail to an address specified in the translation service. The translated mail server 32 receives the translated text to be sent back and may utilize these sentences for the processing according to the present invention.

(Fourth Embodiment)

[0197] A mail translation system in a fourth embodiment of the present invention will be described referring to FIG. 17. FIG. 17 is a diagram showing an architecture of this mail translation system.

[0198] The second and third embodiments discussed above have exemplified the mail translation system designed to detect new mail in the mailbox and to translate the description language thereof.

[0199] What will be explained in the fourth embodiment is a mail translation system designed to translate an appended document described (i.e. written) in English and appended to a mail transmitted from the client device 5.

[0200] Other configurations and functions are the same as those in the second embodiment, and the same components are marked with the like numerals, of which the repetitive explanations are omitted. Further, as the necessity may arise, the drawings in FIGS. 1 through 16 are referred to.

<Architecture>

[0201] FIG. 17 is the diagram showing an architecture of this mail translation system. This mail translation system is, as in the second embodiment, constructed of the client device 5, the mail server 31, the translated mail server 32 and the translation server 33.

[0202] The client device 5 is used as a user interface for creating a document and making a request for translating the document. The user, when he has a document to be translated into English in the process of creating the document by use of the client 5, appends this document to the mail and sends this mail to the translated mail server 32 given a predetermined address for Japanese-English translation.

[0203] The mail server 31 transmits this mail to the translated mail server 32.

[0204] The translated mail server 32 reads the appended document from the mail received with the Japanese-English translation oriented address. Further, the translated mail server 32 sends the text information to the translation server 33 and requests the server 33 to translate it. When a translated result is sent back, the translated mail server 32 rewrites the appended document with the translated result, thus creating the translated appended document.

[0205] Next, the translated mail server 32 transmits

the mail appended with the translated appended document back to the mail server. The mail server stores this reply mail in the mailbox.

[0206] The client device 5 reads the reply mail in the mailbox, and displays the translated reply mail. The user is thereby able to read the translation.

[0207] Similarly, the user sends the appended document in English to a English-Japanese translation oriented address, whereby the appended document in English can be translated into Japanese.

<Modified Example>

[0208] According to the mail translation system in the fourth embodiment, the direction of the translation (Japanese-English, English-Japanese) is specified by the address received by the translated mail server 32. The embodiment of the present invention is not, however, limited to this mode. For instance, the user may specify the direction of the translation when sending the mail, and this specified direction may also be retained in the mailbox 55. The mail server 31 transfers the mail with its translation specified to the translated mail server 32. Then, after a translated result has been sent back, this mail may also be transmitted back to the sender.

[0209] Further, such a translation may be carried out together with the transmission of the mail from one user to another. Namely, the mail server 31 confirms whether or not a mail with its translation specified among the mails requested to be transmitted exists in the mailbox. The mail server 31 transmits the mail with its translation unspecified as it is. On the other hand, the mail server 31, before transmitting the mail with its translation specified to its original destination, transfers this mail to the translated mail server 32. Then, after the translated result has been sent back, the mail server 31 replaces this mail text with the translated result, and may transmit it to the original destination.

<Fifth Embodiment>

[0210] A fifth embodiment of the present invention will be discussed with reference to the drawings in FIGS. 18 through 22. FIG. 18 is a diagram showing an architecture of the translation system in the fifth embodiment. FIG. 19 shows a display screen of a document edit application program 40 executed by the client device 5. FIGS. 20 and 21 are flowcharts each showing processes of the document edit application program 40 executed by the CPU 61 (in Fig.2) of the client device 5 shown in FIG. 18.

[0211] In the first through fourth embodiments, the homepage or mail translation system has been explained. The discussion in the fifth embodiment will be focused on the translation system in linkage with the document edit application program. This translation system comprises the client device 5 for executing the document edit application program, and a server device 8 for executing the translation. Other configurations and functions are the same as those in the first through fourth embodiments. The same components are marked with the like numerals, of which the repetitive explanations are omitted.

[0212] FIG. 18 is a diagram illustrating the architecture of this translation system. This translation system is constructed of the client device 5 (corresponding to a terminal device) for executing the document edit application program 40, and the server device 8 for receiving a translation request from the client device 5 and executing the translation.

[0213] The CPU 61 of the client device 5 executes the document edit application program 40, thereby providing a function as a document creating device (the CPU 61 of the client device 5, which executes the document edit application program 40, corresponds to a document editing unit). The document edited by the client device 5 with the aid of the document edit application program 40, contains display control information for displaying the size, position and shapes of characters, ruled lines etc in addition to the text information (corresponding to statement information).

[0214] Further, the client device 5 executes a control program containing a translation data transmitting/receiving module 41, and performs the communications with the server device 8 (the CPU 61 of the client device 5, which executes the translation data transmitting/receiving module 41, corresponds to a transmitting/receiving unit). The communications with this server device 8 are actualized based on DCOM (Distributed Component Object Model) provided as a function of Windows 98 etc from Microsoft Corp., U.S.A.. Through the communications described above, the document edit application program 40 of the client device 5 makes the server device 8 function to translate the document in the process of being edited. This function enables the user to specify a part of the document in the process of being created and to translate this specified part of the document. Moreover, the whole of the created document can be also translated.

[0215] FIG. 19 illustrates a display screen 460 displayed on a CRT 65 (shown in Fig.2) when the CPU 61 of the client device 5 executes the document edit application program 40. This display screen 460 includes a menu bar consisting of a file menu, an edit menu 461, an environment setting menu and a help menu, an edit area 462 for editing and displaying the text information, a whole text translation button 463 and a partial text translation button 464.

[0216] The edit menu 461 is provided with functional items such as copy, deletion, a whole text translation 465 and a partial text translation 466.

[0217] The whole text translation 465 of the edit menu 461 serves to specify the translation of the whole text information of the document in the process of being edited. The CPU 61(shown in Fig.2) of the client device 5, upon detecting that the whole text translation 465 is se-

lected, transmits the whole text information in the process of being now edited to the server device 8, and makes the server device 8 translate it. The same function is implemented also by the whole text translation button 463.

[0218] The partial text translation 466 of the edit menu 461 serves to specify the translation of a partial text with its range dragged by a mouse 67 (corresponding to a selecting device). Dragging is defined as an operation of depressing a desired position (selection start position) in the document displayed on the screen, then moving this point down to a desired end position, and thus specifying a desired range.

[0219] Referring to FIG. 19, an underline 467 indicates the text selected. In this state, when the partial text translation 466 is selected, the CPU 61 of the client device 5 transmits the partial text information underlined 467 to the server device 8 and makes the server device 8 translate it. Note that the same function is executed also by the partial text translation button 464. The whole text translation 465, the partial text translation 466 of the edit menu 461, or the whole text translation button 463 and the partial text translation button 464, correspond to instruction unit.

[0220] The server device 8 is connected via the network to the client device 5. The server device 8 executes a control program consisting of a data accept module 42 (the CPU 51 of the server device 8, which executes the data accept module 42, corresponds to a transmitting/receiving unit) and a translation processing module 43 (the CPU 51 executing the translation processing module 43 corresponds to a translation unit), thereby providing a translating function. A hardware architecture of the server device 8 is the same as that of the translated text cache server 2 shown in FIG. 2.

[0221] The data accept module 42 performs the DCOM-based communications with a translation data transmitting/receiving module 41 of the control program executed by the client device 5, and receives the translation data and a translation instruction. Then, the data accepting module 42 transfers this item of translation data to the translation processing module 43, and requests the module 43 to translate it. Further, the data accepting module 42 sends a translated result to the translation data transmitting module 41 of the client device 5 through the DCOM-based communications.

[0222] The translation processing module 43 executes the data translation requested by the data accepting module 42.

<Function and Effect>

[0223] FIGS. 20 through 22 show processes of the document edit application program 40 executed by the client device 5. The client device 5 executes this application program 40, thereby providing a document edit function.

[0224] As shown in FIG. 20, the client device 5 is normally in a wait-for-event state (S300). An event is defined as an outside factor for changing a state of the client device 5. When an event occurs, the client device 5 judges a category of this event.

[0225] To start with, the client device 5 judges whether or not the event is an instruction of the partial text translation (S301). If it is, the client device 5 executes a partial translating process (S302). Thereafter, the client device 5 reverts to the wait-for-event state (S300).

[0226] If the event is not an instruction of the partial text translation, the client device 5 judges whether or not the event is an instruction of the whole text translation (S303). If the event is the instruction of the whole text translation, the client device 5 executes a whole translating process (S304). Thereafter, the client device 5 reverts to the wait-for-event state (S300).

[0227] If the event indicates (instructs) neither a partial nor a whole text translation, the client device 5 executes another document edit function (S305). Thereafter, the client device 5 returns to the wait-for-event state (S300).

[0228] FIG. 21 shows the partial translation process. The partial translation process is a process of translating a part of the document in the process of being edited. In this process, the user selects a part of the on-edit document (document being edited) by dragging. The user executes the partial text translation in this state. The partial text translation is carried out by selecting the partial text translation 466 of the edit menu 461 or depressing the partial text translation button 464. With these operations, the partial translation instructing event occurs.

[0229] When the partial translation instructing event occurs, the client device 5, to begin with, reads the text information in the selected range (S3021). Next, the read-out text information is stored in an unillustrated shared memory of the client device 5.

[0230] Subsequently, the client device 5 requests the translation server for the translation via the translation data transmitting/receiving module 41 (S3022). The translation data transmitting/receiving module 41 sends a statement and a translation command put in the unillustrated shared memory to the data accepting module 42 of the server device 8 through the DCOM-based communications.

[0231] Thereafter, the client device 5 comes to a state of waiting for a completion of the translation (S3023). At this time, the text is handed over to the translation processing module 43 from the data accepting module 42, and the translation is carried out by the server device 8. A translated result is sent back to the client device 5 from the data accepting module 42 in accordance with DCOM.

[0232] When the translated result is sent back, the client device 5 replaces the corresponding part of the document with the translated result (S3024).

[0233] FIG. 22 shows the whole text translation process. The whole text translation process is a process of translating the whole of the on-edit document. The

whole text translation is executed by selecting the whole text translation 465 of the edit menu 461 or depressing the whole text translation button 463. With these operations, a whole translation instructing event occurs.

[0234] When the whole translation instructing event occurs, the client device 5, to start with, reads the text information from the on-edit document (S3041). Next, the read-out text information is stored in an unillustrated shared memory of the client device 5.

[0235] Subsequently, the client device 5 requests the translation server for the translation via the translation data transmitting/receiving module 41 (S3042). The translation data transmitting/receiving module 41 sends a statement and a translation command put in the unillustrated shared memory to the data accepting module 42 of the server device 8 through the DCOM-based communications.

[0236] Thereafter, the client device 5 comes to a state of waiting for a completion of the translation (S3043). At this time, the text is handed over to the translation processing module 43 from the data accepting module 42, and the translation is carried out by the server device 8. A translated result is sent back to the client device 5 from the data accepting module 42 in accordance with DCOM.

[0237] When the translated result is sent back, the client device 5 replaces the whole text of the document with the translated result (S3044).

[0238] As discussed above, according to the translation system in the fifth embodiment, the translation is executed by the server device 8, and hence the client device 5 does not need resources (performance of the CPU 61 and capacity of the memory 62) for the translation process. Accordingly, even a client device 5 having limited resources such as a handheld terminal etc is capable of being used in a translation system.

<Modified Example>

[0239] In the embodiment discussed above, the DCOM-based communications are implemented between the client device 5 and the server 8. The embodiment of the present invention is not, however, limited to this communication method. For instance, an RPC (Remote Procedure Call) provided in the UNIX operating system may also be applied to the communications between the client device 5 and the server 8.

[0240] What has been dealt with in the embodiment discussed above is the translating function in the document edit application program 40. The embodiment of the present invention is not, however, restricted to use with a document edit application program 40. That is, the present invention may also be applied with other software such as a word processor, a spreadsheet program, a presentation material creating program, a text editor and so forth.

[0241] In the fifth embodiment discussed above, the client device 5 includes the mouse 67, and the user specifies the text information to be partially translated by dragging the mouse 67. The embodiment of the present invention is not, however, restricted to this device. For example, a touch panel may be used as a substitute for the mouse 67. Further, a pointing device for a flat space etc may also be used. Moreover, for example, a substitute for dragging may also be such an operation that two positions are consecutively depressed, and the text information may be selected from a rectangular region in which a straight line connecting these two points is set as a diagonal line of the rectangle. Alternatively, a character string interposed between those two points may also be set as a translation target.

[0242] Further, there is no necessity of newly providing the translation server 3, and an existing translation service can be utilized. One existing translation service involves an original text being transmitted by way of E-mail to a predetermined address, where a translation server executes the translating process and transmits its translated text back to the sender. For example, the server device 8 extracts the text information of the HTML data and transmits the text information by way of E-mail to an address specified in the translation service. Then, the server device 8 receives the translated text to be sent back and may utilize the translated text for the processing according to the present invention.

Claims

1. A relay device (1) relaying request data from a terminal device (5) to a server device (7) and response data from said server device (7) to said terminal device (5) in response to the request data, said relay device (1) comprising:

   a translation unit(3) translating text information contained in the response data,
   wherein the text information contained in the response data received from said server device (7) is translated by said translation unit (3), and
   a result of this translation is transmitted as response data to said terminal device (5).

2. A relay device (1) relaying request data from a terminal device (5) to a server device (7) and response data from said server device (7) to said terminal device (5) in response to the request data, said relay device comprising:

   a control unit (51) controlling relay and performing communications with a translation server (3) executing a translating process,
   wherein text information contained in the response data received from said server device (7) is translated by said translation server (3), and
   a result of this translation is transmitted as re-

sponse data to said terminal device (5).

3. A relay device (1) according to claim 1 or 2, further comprising:

a caching unit (2) caching the translated result of the response data,
wherein when the translated result of the response data given in response to the request data from said terminal device (5) is cached in said caching unit (2), the translated result cached therein is transmitted by way of response data to the request data to said terminal device (5).

4. A relay device (1) according to claim 3, wherein when the translated result of the response data given in response to the request data from said terminal device (5) is not cached in said caching unit (2), said server device (7) is made to transmit response data to the request, and the translated result of said response data is cached in said caching unit (2).

5. A relay device (1) according to claim 3 or 4, wherein the request data have an identifier specifying a request target, and
said caching unit (2) is accessed based on this identifier.

6. A relay device (1) according to claim 5, wherein the request data have information specifying a translation mode when translating the text information, and
said caching unit (2) caches a result of translation corresponding to the specified translation mode.

7. A relay device (1) according to any preceding claim, wherein the response data have display control information specifying a data display mode and text information described in a specified language, and
the text information excluding the display control information is translated.

8. A relay device (1) according to any preceding claim, wherein request data are relayed from a plurality of terminal devices (5), and the translated result is transmitted as response data to each terminal device (5) which has sent request data.

9. A terminal device (5) connected to a network via a first relay device (1) which relays relay data and also translates the same data and a second relay device (9) which relays the relay data without translating the same data, said terminal device comprising:

an information acquisition module (61,6) acquiring information from the network;
a translation specification recognizing unit (61) recognizing whether the translation of the information is specified or not; and
a routing unit (61) for switching over said relay devices when accessing the network,
wherein when it is recognized that the translation is specified, the information translated by accessing the network from said first relay device (1), is obtained, and
when it is recognized that no translation is specified, the information that is not translated by accessing the network from said second relay device (9), is obtained.

10. A terminal device (5) according to claim 9, further comprising:

an individual translation indicator indicating a translation of information acquired by said information acquisition module (61,6) from the network for every item of information; and
an auto translation indicator (21a) uniformly indicating the translation of the information acquired by said information acquisition module (61,6) from the network.

11. A terminal device (5) according to claim 9 or 10, further comprising a display unit (65) displaying the information in pieces,
wherein each piece of information before being translated and the corresponding translated information are displayed with each piece of information next to its translation, in a side-by-side translation mode.

12. A terminal device (5) according to claim 9 or 10, further comprising a display unit (65) including a plurality of screen areas displaying the information,
wherein the information before being translated and the translated information are displayed respectively in screen areas different from each other.

13. A relay device (1) relaying data between an internal network in which a principal language describing text information is prescribed, and an external network in which the language describing the text information is not limited, said relay device (1) comprising:

a description language judging unit (51) judging the description language of the text information contained in the data to be relayed; and
a translation unit (3) translating the text information,
wherein when the data from the external network are relayed to the internal network, the description language of the text information contained in that data is translated into the principal language of the internal network.

14. A relay device (1) relaying data between an internal network in which a principal language for describing text information is prescribed, and an external network in which the language for describing the text information is not limited, said relay device (1) comprising:

a description language judging unit (51) judging the description language of the text information contained in the data to be relayed; and
a control unit (51) performing communications with a translation server (3) executing a translating process,
wherein when the data from the external network are relayed to the internal network, said control unit (51) instructs said translation server (3) to translate the text information and said translation server (3) translates the description language of the text information contained in the data to be relayed into the principal language of the internal network.

15. A relay device according to claim 13 or 14, further comprising a caching unit (2) caching a translated result,

wherein when the translated result of the communication data is cached in said caching unit (2), the translated result is read from said caching unit, and
the translated data are relayed.

16. A server device (1) executing transmitting/receiving services between a service receiving terminal (5) in which a principal language for describing text information is prescribed, and an external communication device in which the language for describing the text information is not limited, said server device (1) comprising:

a description language judging unit (51) judging the description language of the text information contained in data to be received; and
a translation unit (3) translating the text information,
wherein when receiving the data from said external communication device, the description language of the text information is translated into the principal language of said service receiving terminal (5).

17. A server device (1) executing transmitting/receiving services between a service receiving terminal (5) in which a principal language for describing text information is prescribed, and an external communication device in which the language for describing the text information is not limited, said server device (1) comprising:

a description language judging unit (51) judging the description language of the text information contained in data to be received; and
a control unit (51) performing communications with a translation server (3) for translating the text information,
wherein when receiving the data from said external communication device, said control unit (51) instructs said translation server (3) to translate the text information, and said translation server (3) translates the description language of the text information contained in the data to be received into the principal language of said service receiving terminal (5).

18. A server device (1) according to claim 16 or 17, wherein said description language judging unit (51) judges the description language of the text information based on whether or not there exists a word characteristic of the description language that is contained in the text information, and/or based on character code information which expresses the description language.

19. A server device (1) executing data transmitting/receiving services between a service receiving terminal (5) and an external communication device, comprising:

a user information storage module (34) specifying a user of said service receiving terminal (5), a translating language by which text information contained in the data is translated, and a translated language into which the text information is translated; and
a translation unit (3) for translating the text information.

20. A server device (1) executing data transmitting/receiving services between a service receiving terminal (5) and an external communication device, comprising:

a user information storage module (34) specifying a user of said service receiving terminal, a translating language by which text information contained in the data is translated, and a translated language into which the text information is translated; and
a control unit (51) executing communications with a translation server (33) translating the text information.

21. A server device (1) according to any one of claims 16 to 20, wherein the data are E-mail data including mail control information and a text, and

the text left by removing the mail control information from the E-mail data, is translated.

22. A server device (1) according to any one of claims 16 to 20, wherein the communication data are E-mail data including mail control information, a text and an appended document, and

at least one of the text and the appended document left by removing the mail control information from the E-mail data, is translated.

23. A translation system comprising:

a terminal device (5) connected to a network; and
a server device (8) connected to the network,
said terminal device (5) including:
a document edit module (40) editing document data having text information and display control information for the text information; and
a transmitting/receiving unit (41) transmitting and receiving the text information to and from said server device (8),
said server device (8) including:
a transmitting/receiving unit (42) transmitting and receiving the text information to and from said terminal device; and
a translation unit (43) translating the text information received into a specified language,
wherein a part or the whole of the document data in the process of being edited is translated into the specified language.

24. A terminal device (5) connected via a network to a server device (8) for translating text information into a specified language, comprising:

a document editing unit (40) editing document data having text information and display control information for the text information; and
a transmitting/receiving unit (41) transmitting and receiving the text information to and from said server device (8),
wherein said server device (8) is made to translate a part or the whole of the document data in the process of being edited into the specified language.

25. A terminal device (5) according to claim 24, further comprising an instruction unit (463, 464, 465,466) instructing an execution of the translation.

26. A terminal device according to claim 24 or 25, further comprising:

a display unit (65) displaying the document where document data is in the process of being edited; and
a selecting device (65,66,67) selecting a part of the document,
wherein a part or the whole of said document is translated into the language specified.

27. A program of instructions executable by a machine to perform method steps for functioning as a relay device (1), the method steps comprising:

relaying request data from a terminal device (5) to a server device (7) and response data from said server device (7) to said terminal device (5) in response to the request data; and
translating text information contained in the response data,
wherein the text information contained in the response data received from said server device is translated by said translation unit (3), and
a result of this translation is transmitted as response data to said terminal device (5).

28. A program of instructions executable by a machine to perform method steps for functioning as a relay device (1), the method steps comprising:

relaying request data from a terminal device (5) to a server device (7) and response data from said server device (7) to said terminal device (5) in response to the request data; and
performing communications with a translation server (3) for executing a translating process,
wherein text information contained in the response data received from said server device (7) is translated by said translation server (3), and
a result of this translation is transmitted as response data to said terminal device (5).

29. A program according to claim 28, further comprising instructions for caching the translated result of the response data,

wherein when the translated result of the response data given in response to the request data from said terminal device (5) is cached in said step of caching, the translated result cached therein is transmitted by way of response data to the request data to said terminal device.

30. A program according to claim 29, wherein when the translated result of the response data given in response to the request data from said terminal device (5) is not cached in said step of caching, said server device (7) is made to transmit response data to the request data, and the translated result of said response data is cached in said caching unit (2).

31. A program of instructions executable by a machine to perform method steps comprising:

acquiring information from a network;
recognizing whether the translation of the infor-

mation is specified or not;
acquiring, when recognizing that the translation is specified, the information translated by accessing the network via a first relay device (1) for translating the data and relaying the same data; and
acquiring, when recognizing no specification of the translation, the information by accessing the network via a second relay device (9) for transferring the data.

32. A program of instructions executable by a machine to perform method steps for making said machine perform transmitting/receiving services between a service receiving terminal (5) in which a principal language for describing text information is prescribed, and an external communication device in which the language for describing the text information is not limited, the method steps comprising:

judging the description language of the text information contained in data to be received;
performing communications with a translation server (3) for executing a translation process; and
instructing, when receiving the data from said external communication device, said translation server (3) to translate the text information, and translate the description language of the text information contained in the data to be received into the principal language of said service receiving terminal (5).

33. A program of instructions executable by a machine to perform method steps for translating text information into a specified language, the method steps comprising:

permitting editing by a user of document data having text information and display control information for the text information; and
transmitting and receiving the text information to and from said server device (8),
wherein a part or the whole of the document data in the process of being edited is translated into the specified language.

34. A relaying method comprising:

relaying request data from a terminal device (5) to a server device (7) and response data from said server device (7) to said terminal device (5) in response to the request data; and
translating text information contained in the response data,
wherein the text information contained in the response data received from said server device is translated by said translation unit (3), and
a result of this translation is transmitted as response data to said terminal device (5).

35. A relaying method comprising:

relaying request data from a terminal device (5) to a server device (7) and response data from said server device (7) to said terminal device (5) in response to the request data; and
performing communications with a translation server (3) for executing a translating process,
wherein text information contained in the response data received from said server device (7) is translated by said translation server (3), and
a result of this translation is transmitted as response data to said terminal device (5).

36. A relaying method according to claim 35, further comprising:

caching the translated result of the response data,
wherein when the translated result of the response data given in response to the request data from said terminal device (5) is cached in said step of caching, the translated result cached therein is transmitted by way of response data to the request data to said terminal device.

37. A relaying method according to claim 36,
wherein when the translated result of the response data given in response to the request data from said terminal device (5) is not cached in said step of caching, said server device (7) is made to transmit response data to the request data and the translated result of said response data is cached in said caching unit (2).

38. A communication method comprising:

acquiring information from a network;
recognizing whether a translation of the information is specified or not;
acquiring, when it is recognized that the translation is specified, the information translated by accessing the network via a first relay device (1) for translating the data and relaying the same data; and
acquiring, when it is recognized that no translation is specified, the information by accessing the network via a second relay device (9) for transferring the data.

39. A method of transmitting/receiving data between a service receiving terminal in which a principal language for describing text information is prescribed,

and an external communication device in which the language for describing the text information is not limited, the method steps comprising:

judging the description language of the text information contained in data to be received;
performing communications with a translation server (3) for executing a translation process;
instructing, when receiving the data from said external communication device, said translation server (3) to translate the text information, and translate the description language of the text information contained in the data to be received into the principal language of said service receiving terminal (5).

40. A method for translating text information into a specified language, comprising:

editing document data having text information and display control information for the text information; and
transmitting and receiving the text information to and from a server device (8),
wherein a part or the whole of the document data in the process of being edited is automatically translated into the specified language.

41. A storage medium readable by a machine and storing the program of any of claims 27 to 33.

FIG.1

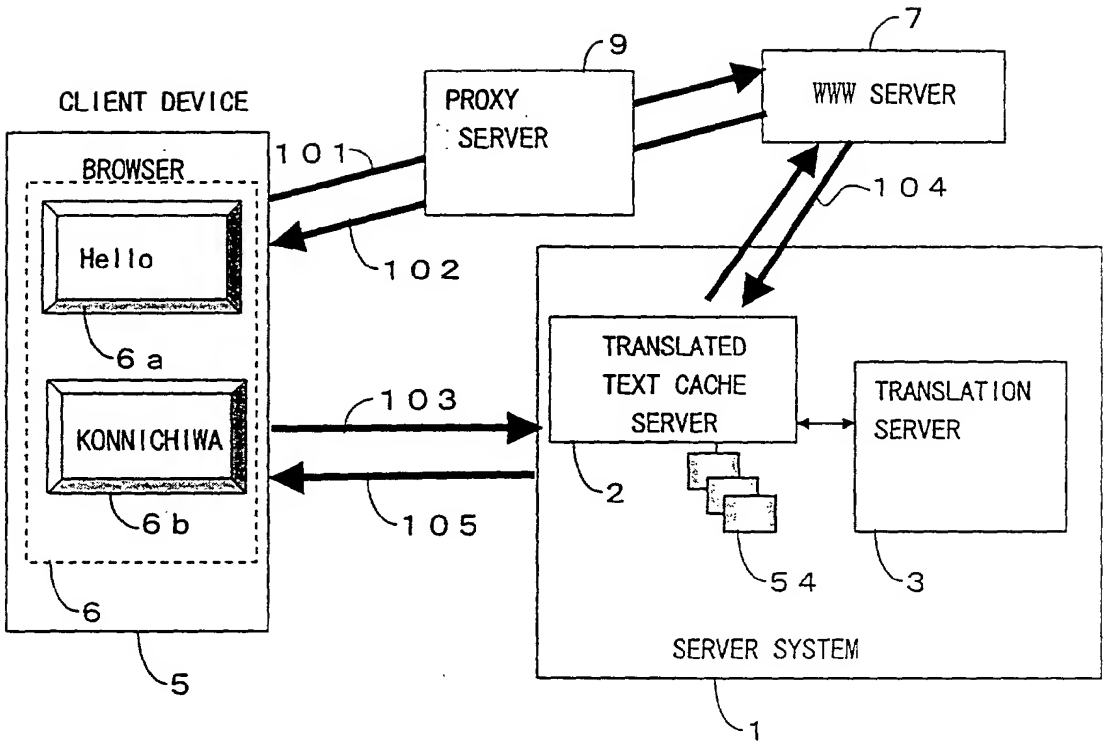

CLIENT DEVICE
BROWSER
Hello
6a
KONNICHIWA
6b
6
5
101
102
103
105
PROXY SERVER
9
WWW SERVER
7
104
TRANSLATED TEXT CACHE SERVER
2
TRANSLATION SERVER
3
54
SERVER SYSTEM
1

FIG. 2

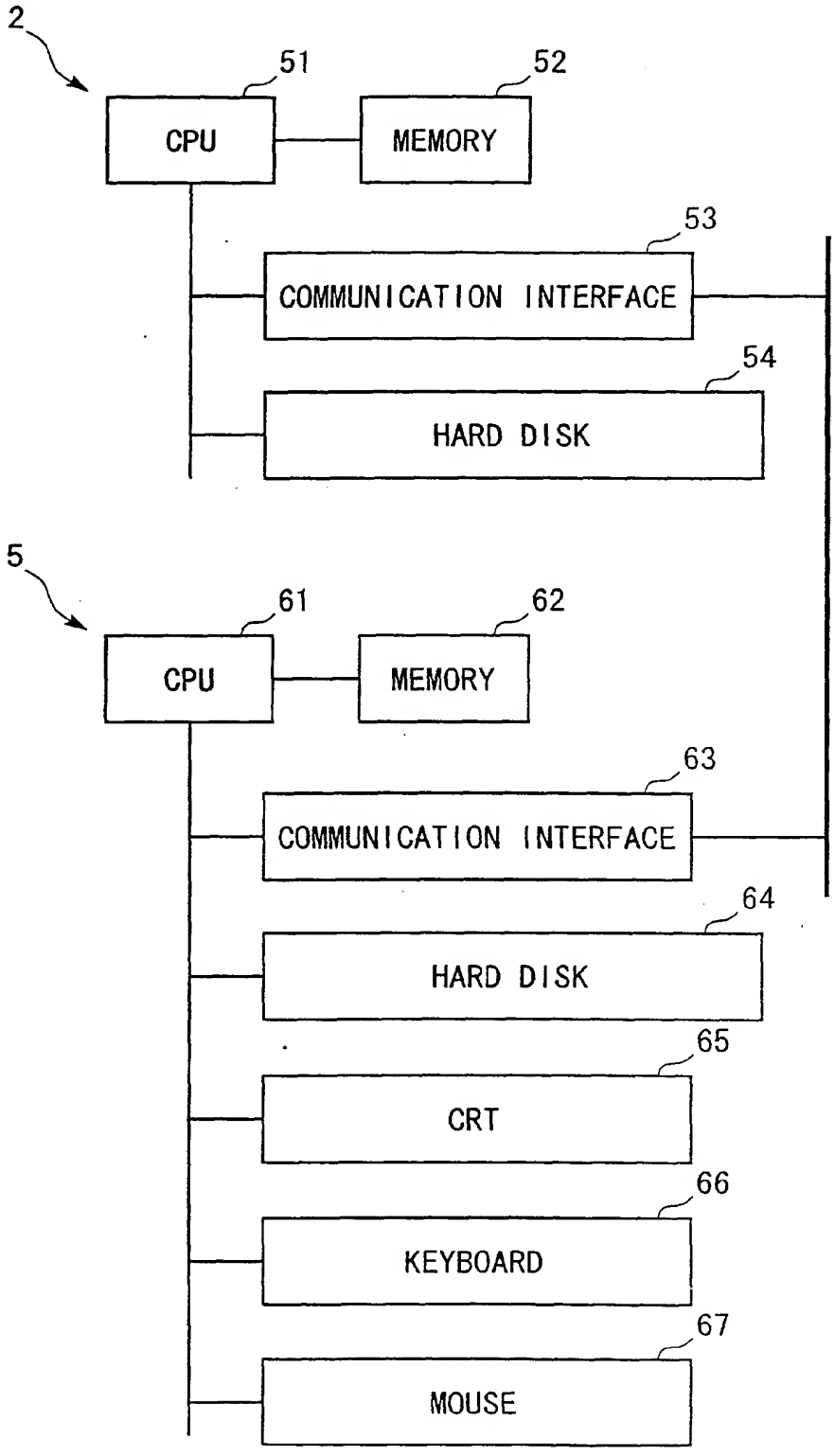

2
51
52
CPU
MEMORY
53
COMMUNICATION INTERFACE
54
HARD DISK
5
61
62
CPU
MEMORY
63
COMMUNICATION INTERFACE
64
HARD DISK
65
CRT
66
KEYBOARD
67
MOUSE

FIG. 3

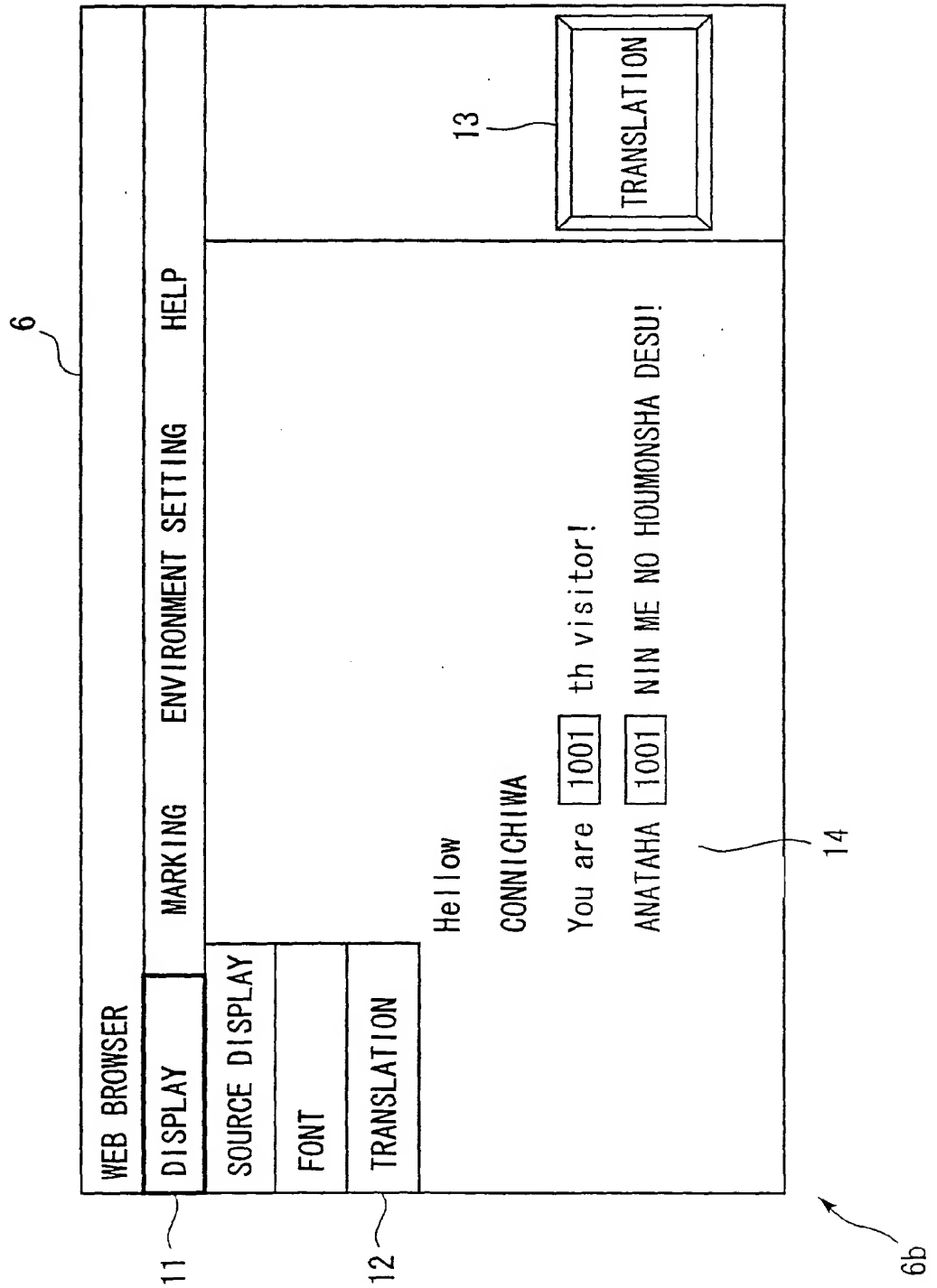

6
WEB BROWSER
DISPLAY
MARKING
ENVIRONMENT SETTING
HELP
SOURCE DISPLAY
FONT
TRANSLATION
11
12
13
TRANSLATION
Hellow
CONNICHIWA
You are 1001 th visitor!
ANATAHA 1001 NIN ME NO HOUMONSHA DESU!
14
6b

FIG. 4

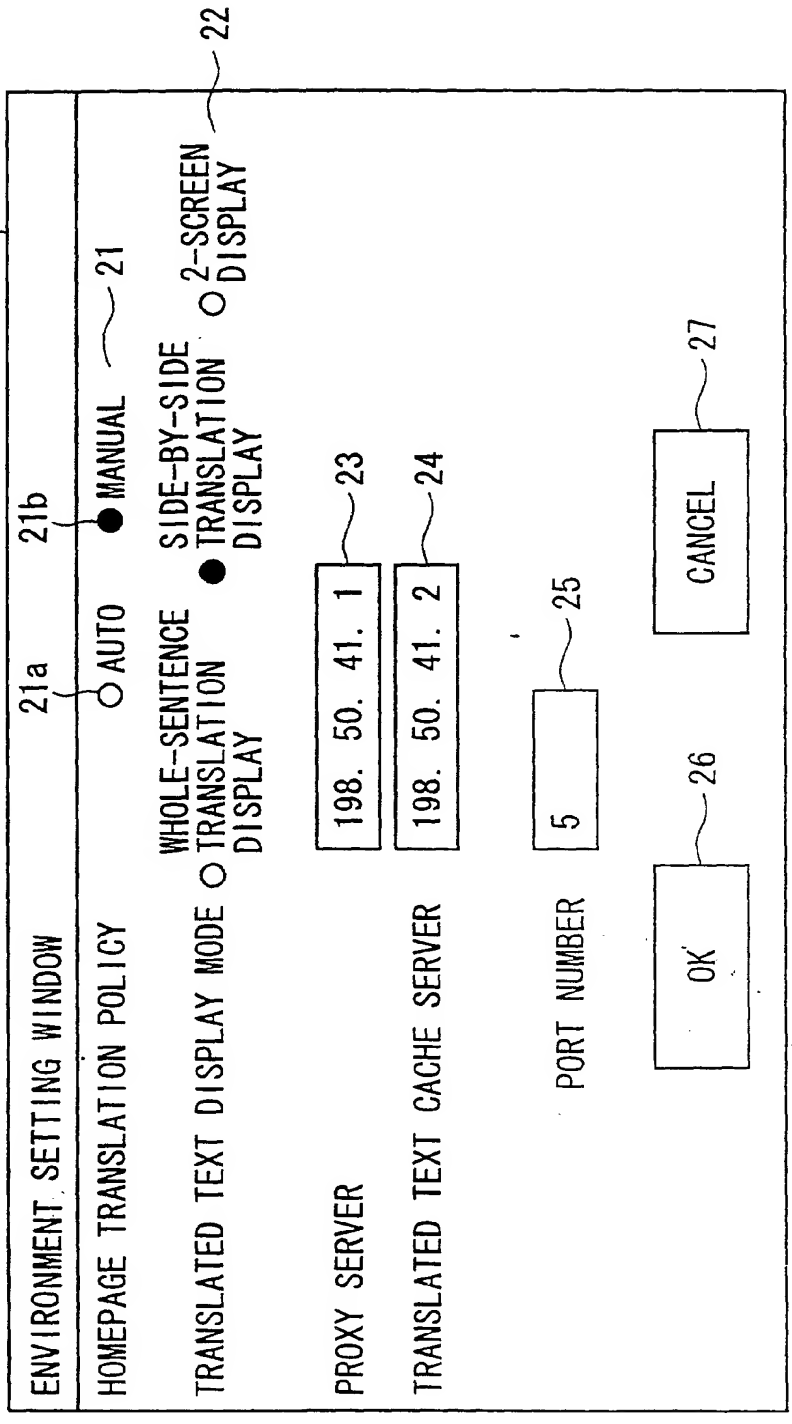

20
ENVIRONMENT SETTING WINDOW
21a
21b
HOMEPAGE TRANSLATION POLICY
AUTO
MANUAL
21
TRANSLATED TEXT DISPLAY MODE
WHOLE-SENTENCE TRANSLATION DISPLAY
SIDE-BY-SIDE TRANSLATION DISPLAY
2-SCREEN DISPLAY
22
PROXY SERVER
198. 50. 41. 1
23
TRANSLATED TEXT CACHE SERVER
198. 50. 41. 2
24
PORT NUMBER
5
25
OK
26
CANCEL
27

FIG. 5

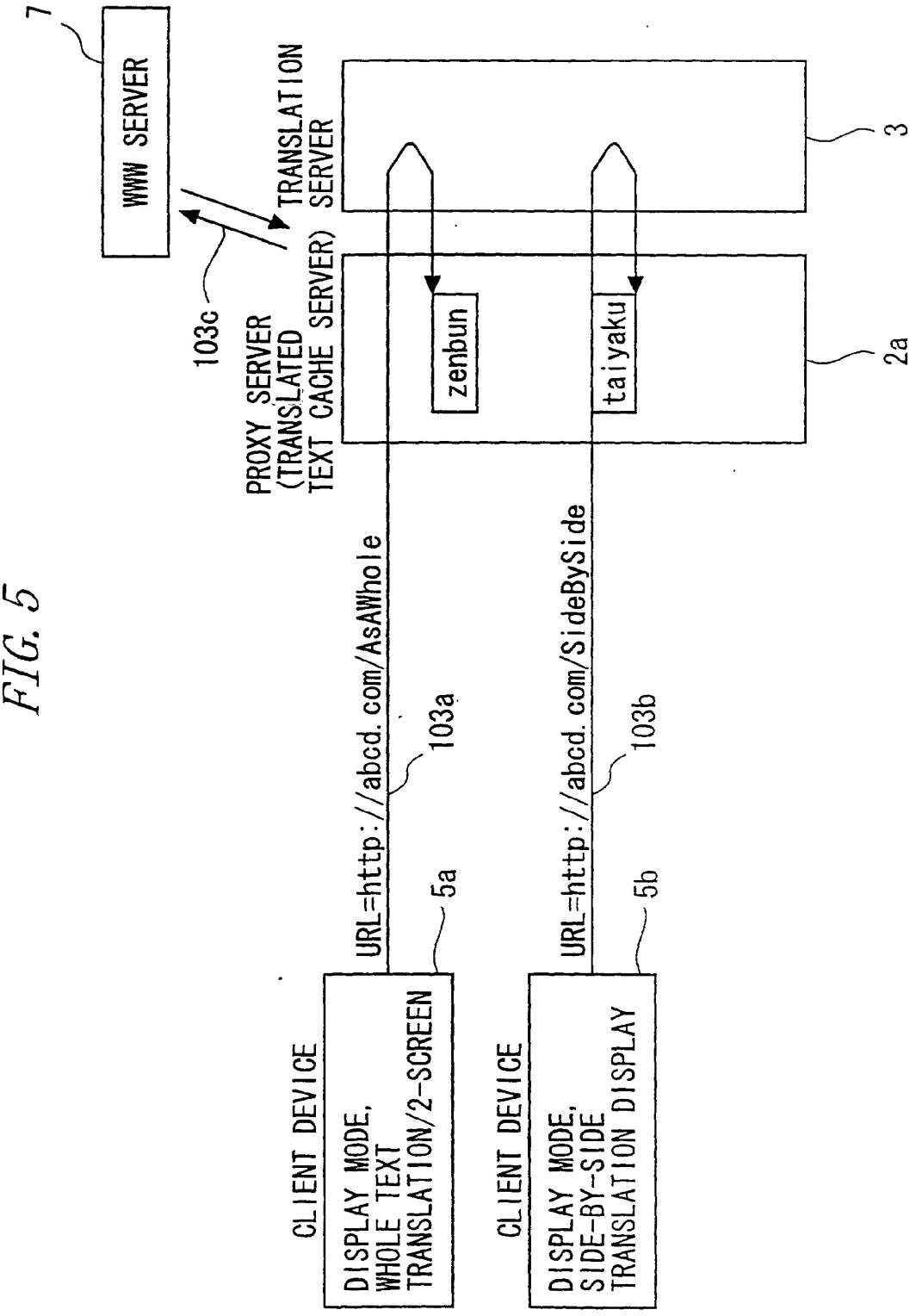

7
WWW SERVER
TRANSLATION SERVER
3
103c
PROXY SERVER (TRANSLATED TEXT CACHE SERVER)
zenbun
taiyaku
2a
URL=http://abcd.com/AsAWhole
103a
URL=http://abcd.com/SideBySide
103b
CLIENT DEVICE
DISPLAY MODE, WHOLE TEXT TRANSLATION/2-SCREEN
5a
CLIENT DEVICE
DISPLAY MODE, SIDE-BY-SIDE TRANSLATION DISPLAY
5b

FIG. 6

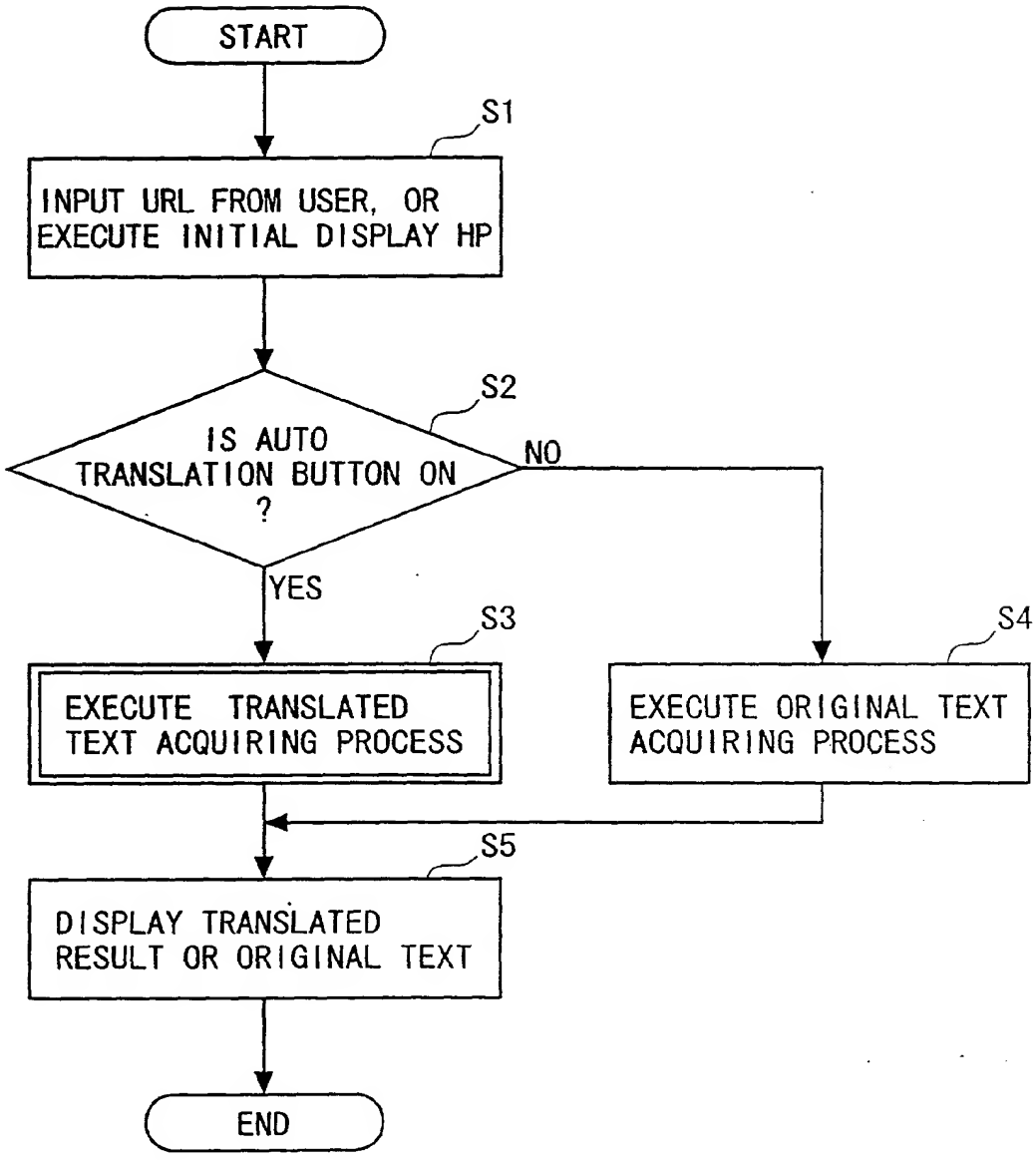

START
S1
INPUT URL FROM USER, OR EXECUTE INITIAL DISPLAY HP
S2
IS AUTO TRANSLATION BUTTON ON ?
NO
YES
S3
EXECUTE TRANSLATED TEXT ACQUIRING PROCESS
S4
EXECUTE ORIGINAL TEXT ACQUIRING PROCESS
S5
DISPLAY TRANSLATED RESULT OR ORIGINAL TEXT
END

FIG. 7

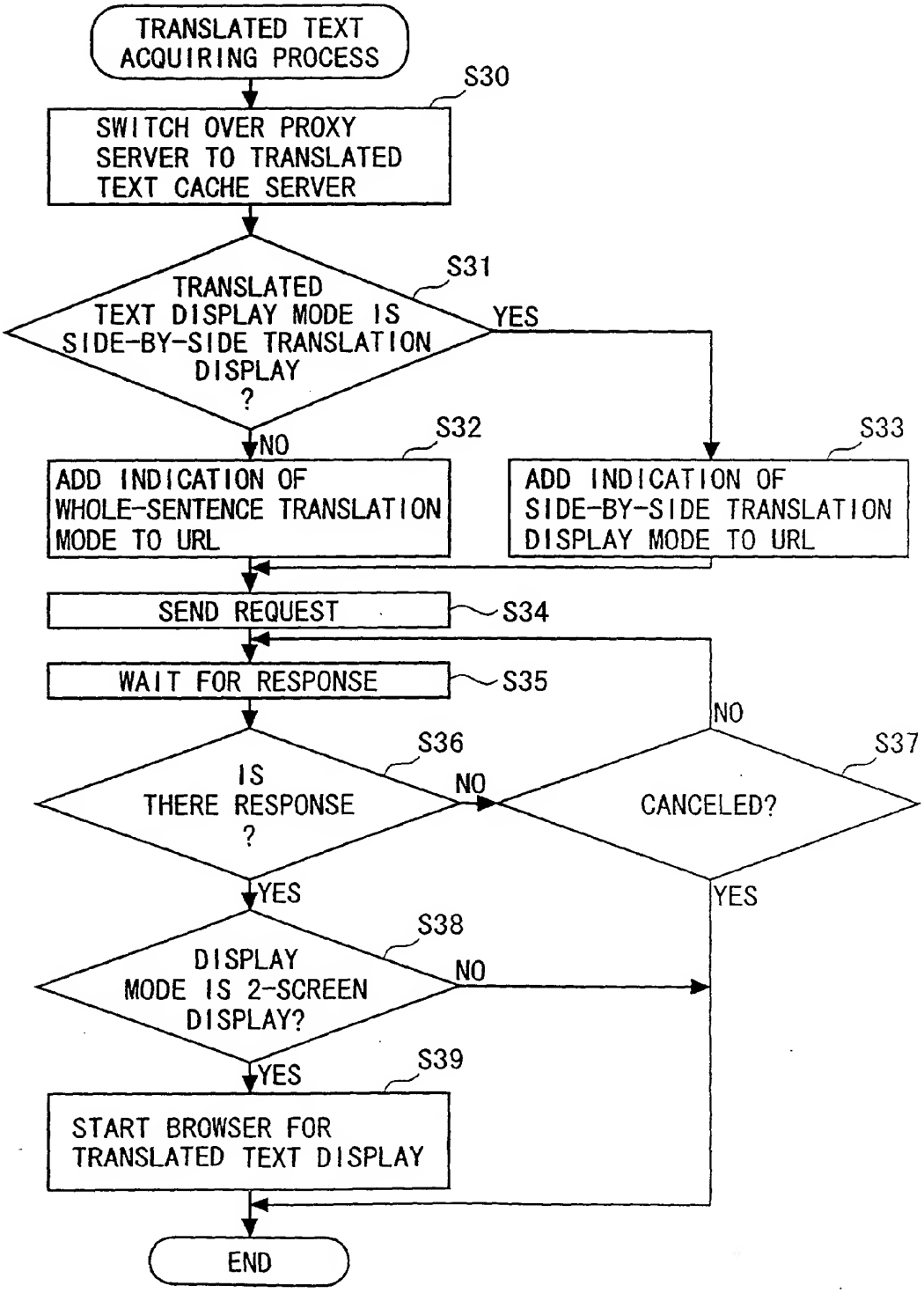

TRANSLATED TEXT ACQUIRING PROCESS
S30
SWITCH OVER PROXY SERVER TO TRANSLATED TEXT CACHE SERVER
S31
TRANSLATED TEXT DISPLAY MODE IS SIDE-BY-SIDE TRANSLATION DISPLAY ?
YES
NO
S32
ADD INDICATION OF WHOLE-SENTENCE TRANSLATION MODE TO URL
S33
ADD INDICATION OF SIDE-BY-SIDE TRANSLATION DISPLAY MODE TO URL
SEND REQUEST
S34
WAIT FOR RESPONSE
S35
S36
IS THERE RESPONSE ?
NO
S37
CANCELED?
NO
YES
YES
S38
DISPLAY MODE IS 2-SCREEN DISPLAY?
NO
YES
S39
START BROWSER FOR TRANSLATED TEXT DISPLAY
END

FIG. 8

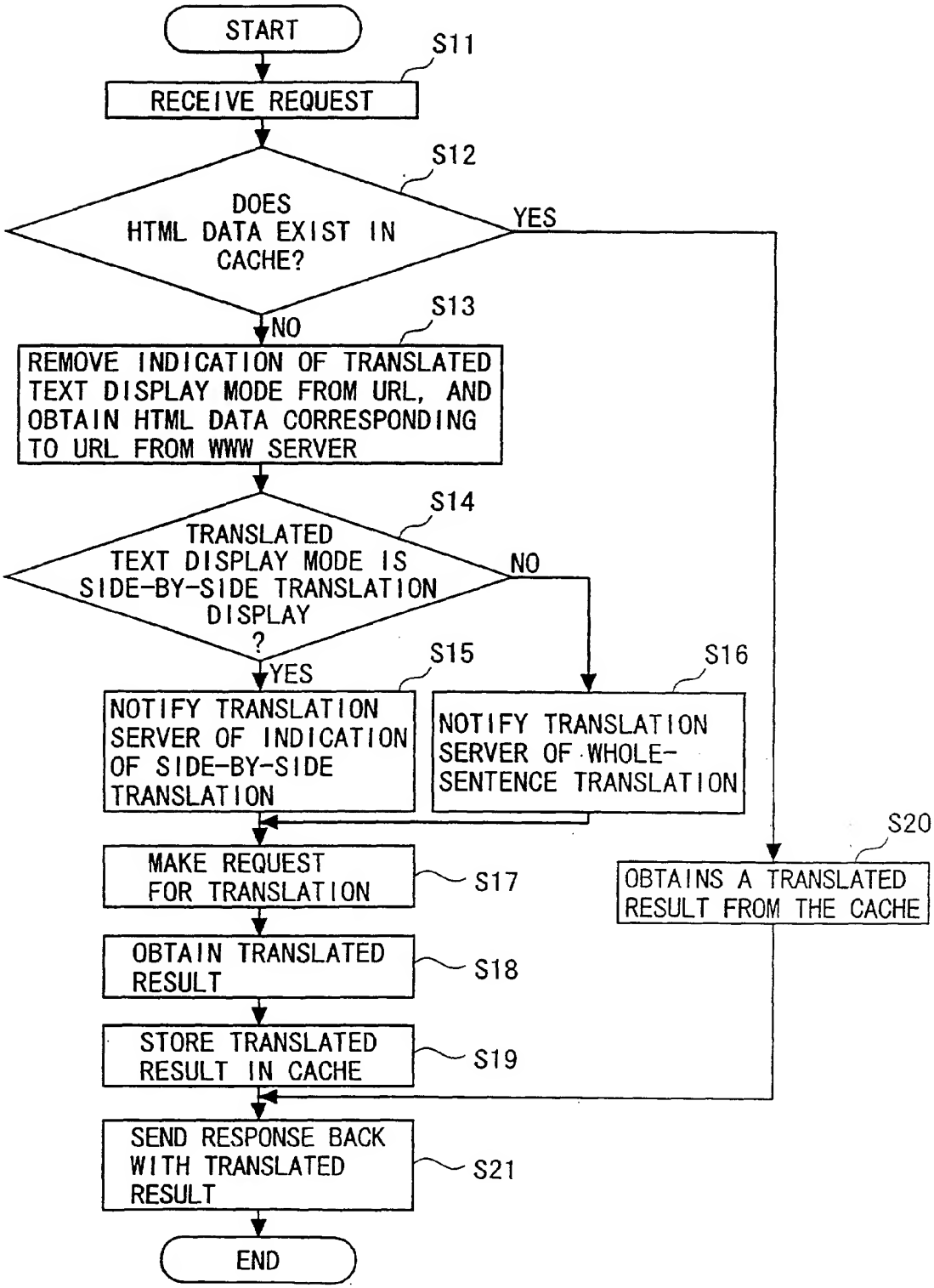

START
S11
RECEIVE REQUEST
S12
DOES HTML DATA EXIST IN CACHE?
YES
NO
S13
REMOVE INDICATION OF TRANSLATED TEXT DISPLAY MODE FROM URL, AND OBTAIN HTML DATA CORRESPONDING TO URL FROM WWW SERVER
S14
TRANSLATED TEXT DISPLAY MODE IS SIDE-BY-SIDE TRANSLATION DISPLAY ?
NO
YES
S15
NOTIFY TRANSLATION SERVER OF INDICATION OF SIDE-BY-SIDE TRANSLATION
S16
NOTIFY TRANSLATION SERVER OF WHOLE-SENTENCE TRANSLATION
S20
OBTAINS A TRANSLATED RESULT FROM THE CACHE
MAKE REQUEST FOR TRANSLATION
S17
OBTAIN TRANSLATED RESULT
S18
STORE TRANSLATED RESULT IN CACHE
S19
SEND RESPONSE BACK WITH TRANSLATED RESULT
S21
END

FIG.9

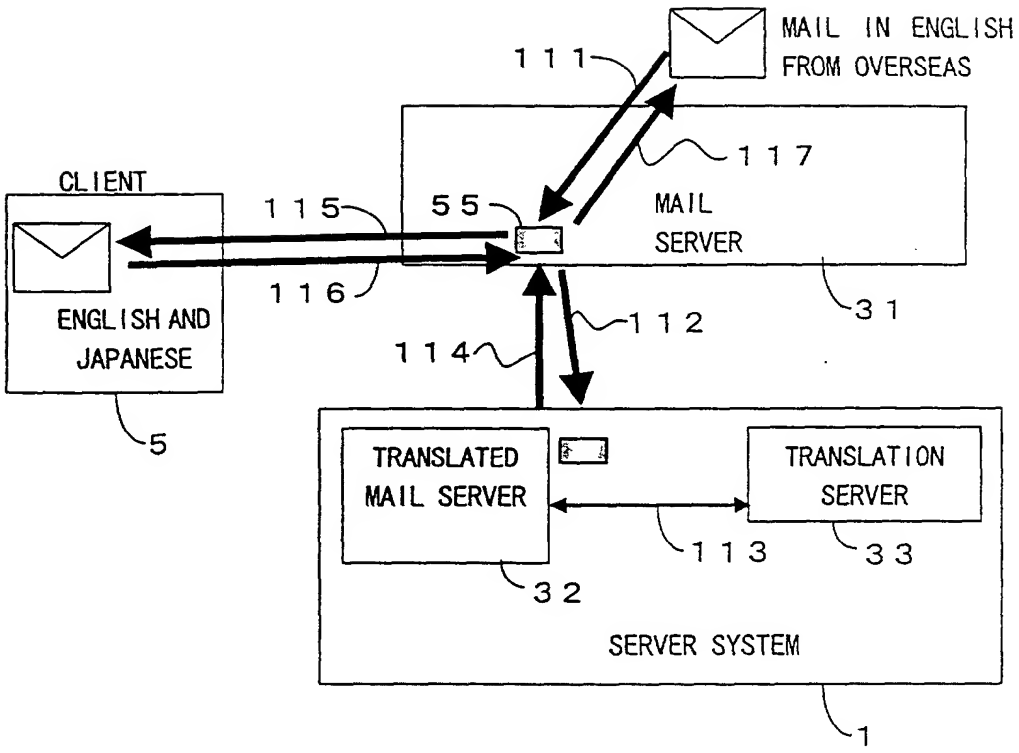

MAIL IN ENGLISH
FROM OVERSEAS
111
117
CLIENT
115
55
MAIL
SERVER
116
31
ENGLISH AND
JAPANESE
112
114
5
TRANSLATED
MAIL SERVER
TRANSLATION
SERVER
113
33
32
SERVER SYSTEM
1

FIG. 10

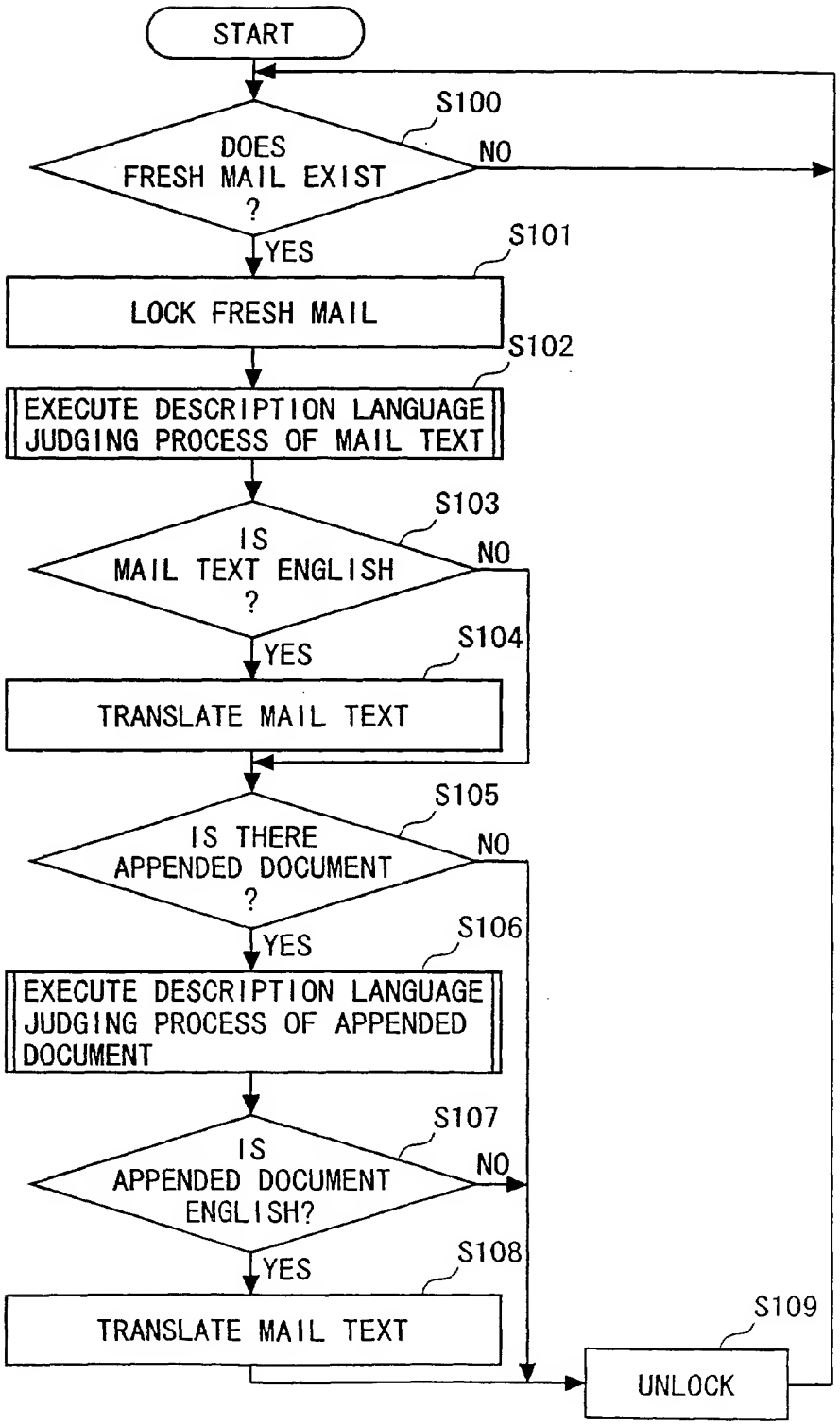

START
S100
DOES FRESH MAIL EXIST ?
NO
YES
S101
LOCK FRESH MAIL
S102
EXECUTE DESCRIPTION LANGUAGE JUDGING PROCESS OF MAIL TEXT
S103
IS MAIL TEXT ENGLISH ?
NO
YES
S104
TRANSLATE MAIL TEXT
S105
IS THERE APPENDED DOCUMENT ?
NO
YES
S106
EXECUTE DESCRIPTION LANGUAGE JUDGING PROCESS OF APPENDED DOCUMENT
S107
IS APPENDED DOCUMENT ENGLISH?
NO
YES
S108
TRANSLATE MAIL TEXT
S109
UNLOCK

FIG. 11

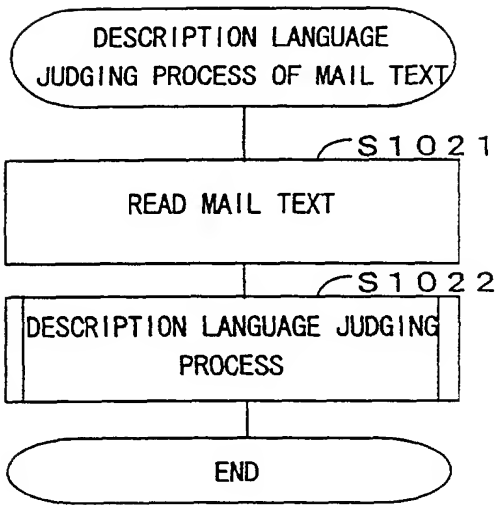

DESCRIPTION LANGUAGE JUDGING PROCESS OF MAIL TEXT
S1021
READ MAIL TEXT
S1022
DESCRIPTION LANGUAGE JUDGING PROCESS
END

FIG. 12

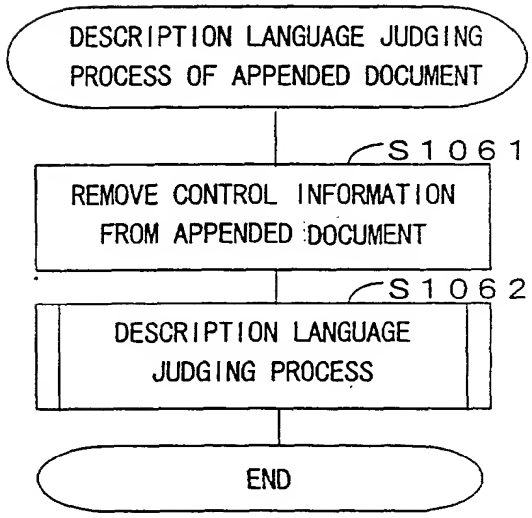

DESCRIPTION LANGUAGE JUDGING PROCESS OF APPENDED DOCUMENT
S1061
REMOVE CONTROL INFORMATION FROM APPENDED DOCUMENT
S1062
DESCRIPTION LANGUAGE JUDGING PROCESS
END

FIG. 13

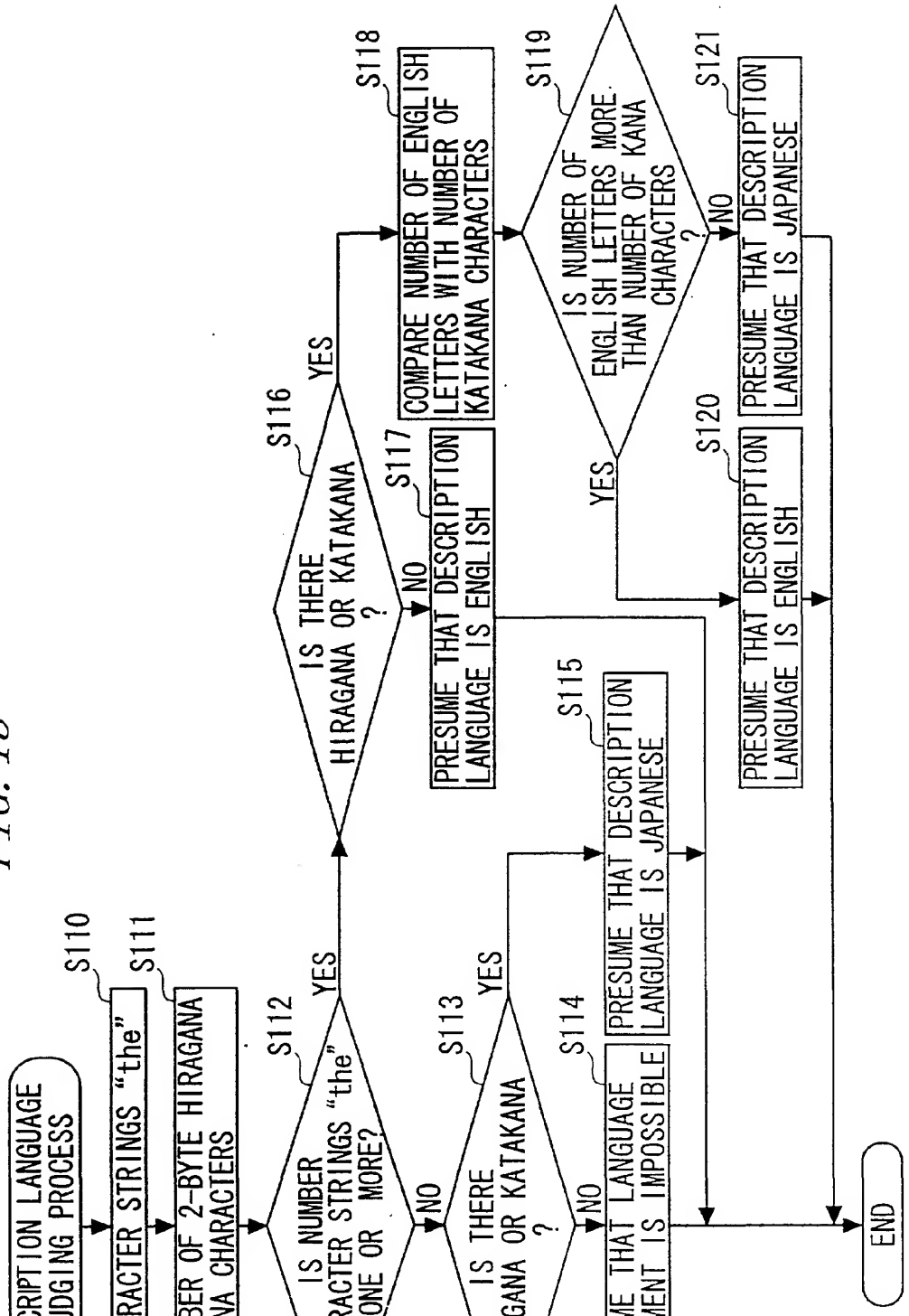

DESCRIPTION LANGUAGE JUDGING PROCESS
S110
COUNT CHARACTER STRINGS "the"
S111
COUNT NUMBER OF 2-BYTE HIRAGANA OR KATAKANA CHARACTERS
S112
IS NUMBER OF CHARACTER STRINGS "the" ONE OR MORE?
YES
NO
S113
IS THERE HIRAGANA OR KATAKANA ?
YES
NO
S114
PRESUME THAT LANGUAGE JUDGEMENT IS IMPOSSIBLE
S115
PRESUME THAT DESCRIPTION LANGUAGE IS JAPANESE
S116
IS THERE HIRAGANA OR KATAKANA ?
YES
NO
S117
PRESUME THAT DESCRIPTION LANGUAGE IS ENGLISH
S118
COMPARE NUMBER OF ENGLISH LETTERS WITH NUMBER OF KATAKANA CHARACTERS
S119
IS NUMBER OF ENGLISH LETTERS MORE THAN NUMBER OF KANA CHARACTERS ?
YES
NO
S120
PRESUME THAT DESCRIPTION LANGUAGE IS ENGLISH
S121
PRESUME THAT DESCRIPTION LANGUAGE IS JAPANESE
END

FIG. 14

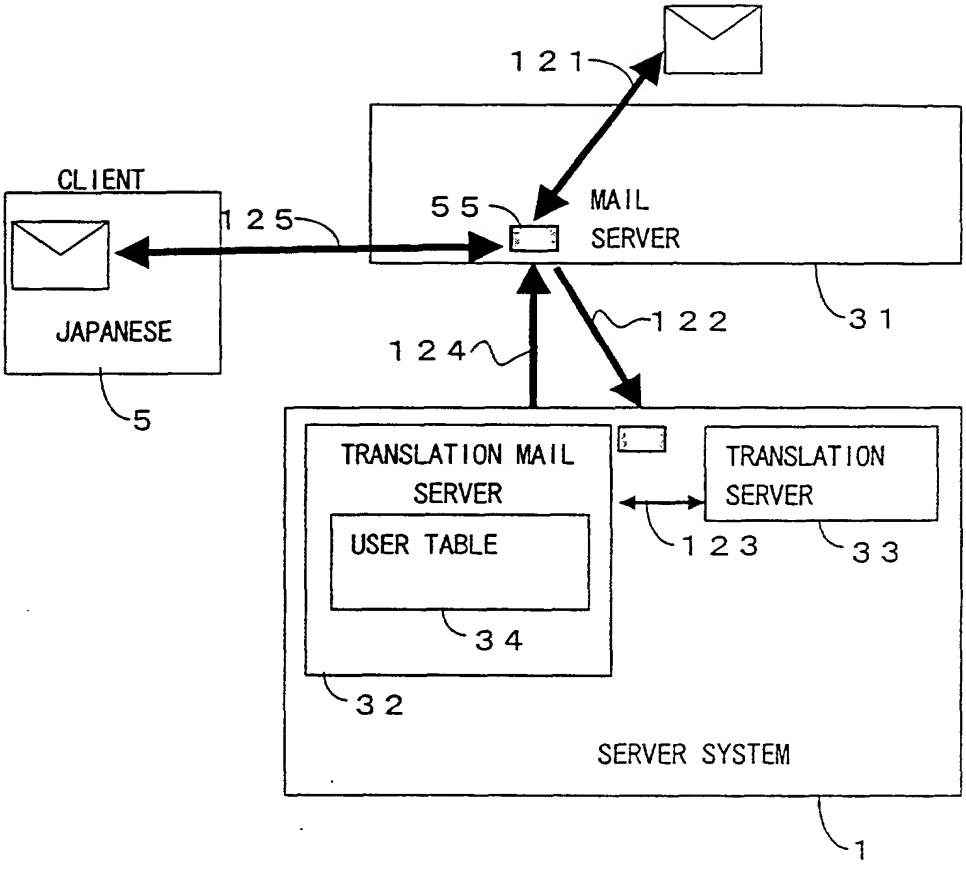

121
CLIENT
125
55
MAIL
SERVER
JAPANESE
5
124
122
31
TRANSLATION MAIL
SERVER
USER TABLE
34
32
TRANSLATION
SERVER
123
33
SERVER SYSTEM
1

FIG.15

REGISTRATION No	SENDER	RECEIVER	DIRECTION OF TRANSLATION
001	ALL	skasai@aaa.co.jp	ENGLISH-JAPANESE
002	skasai@aaa.co.jp	jack@bbb.com	JAPANESE-ENGLISH
003	skasai@aaa.co.jp	betty@ccc.com	JAPANESE-ENGLISH
.	.	.	.
.	.	.	.
.	.	.	.
NNN	ALL	okada@aaa.co.jp	ENGLISH-JAPANESE

FIG. 16

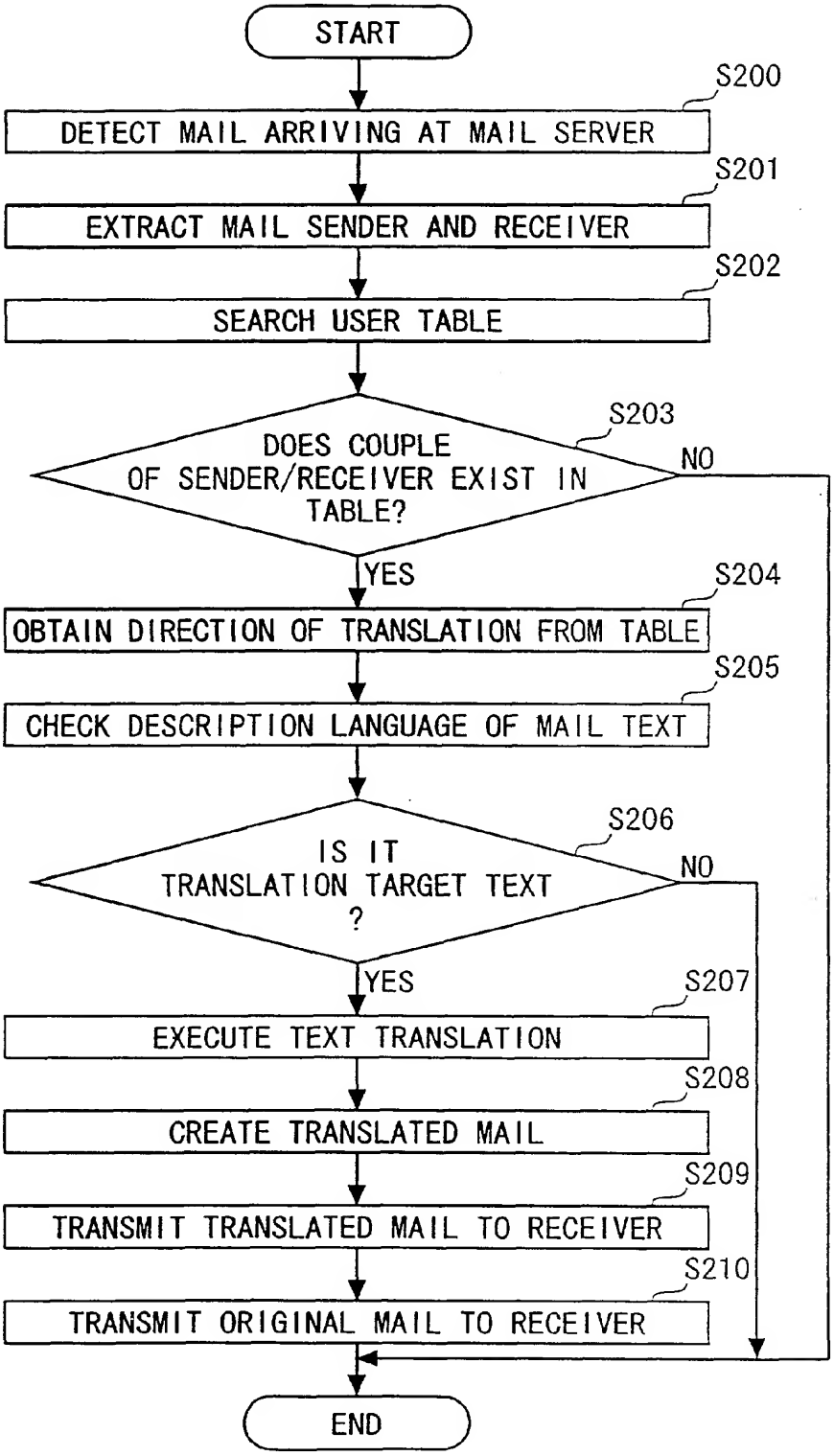

START
S200
DETECT MAIL ARRIVING AT MAIL SERVER
S201
EXTRACT MAIL SENDER AND RECEIVER
S202
SEARCH USER TABLE
S203
DOES COUPLE OF SENDER/RECEIVER EXIST IN TABLE?
NO
YES
S204
OBTAIN DIRECTION OF TRANSLATION FROM TABLE
S205
CHECK DESCRIPTION LANGUAGE OF MAIL TEXT
S206
IS IT TRANSLATION TARGET TEXT ?
NO
YES
S207
EXECUTE TEXT TRANSLATION
S208
CREATE TRANSLATED MAIL
S209
TRANSMIT TRANSLATED MAIL TO RECEIVER
S210
TRANSMIT ORIGINAL MAIL TO RECEIVER
END

FIG.17

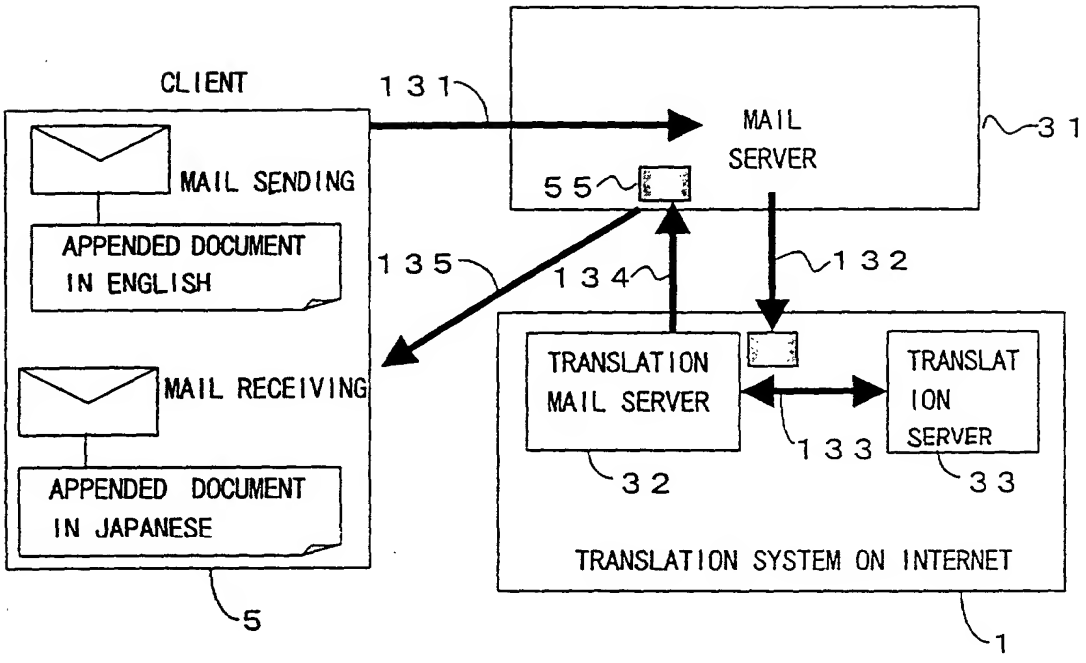

CLIENT
131
MAIL SERVER
31
55
MAIL SENDING
APPENDED DOCUMENT IN ENGLISH
135
134
132
MAIL RECEIVING
APPENDED DOCUMENT IN JAPANESE
TRANSLATION MAIL SERVER
TRANSLAT ION SERVER
133
32
33
TRANSLATION SYSTEM ON INTERNET
5
1

FIG. 18

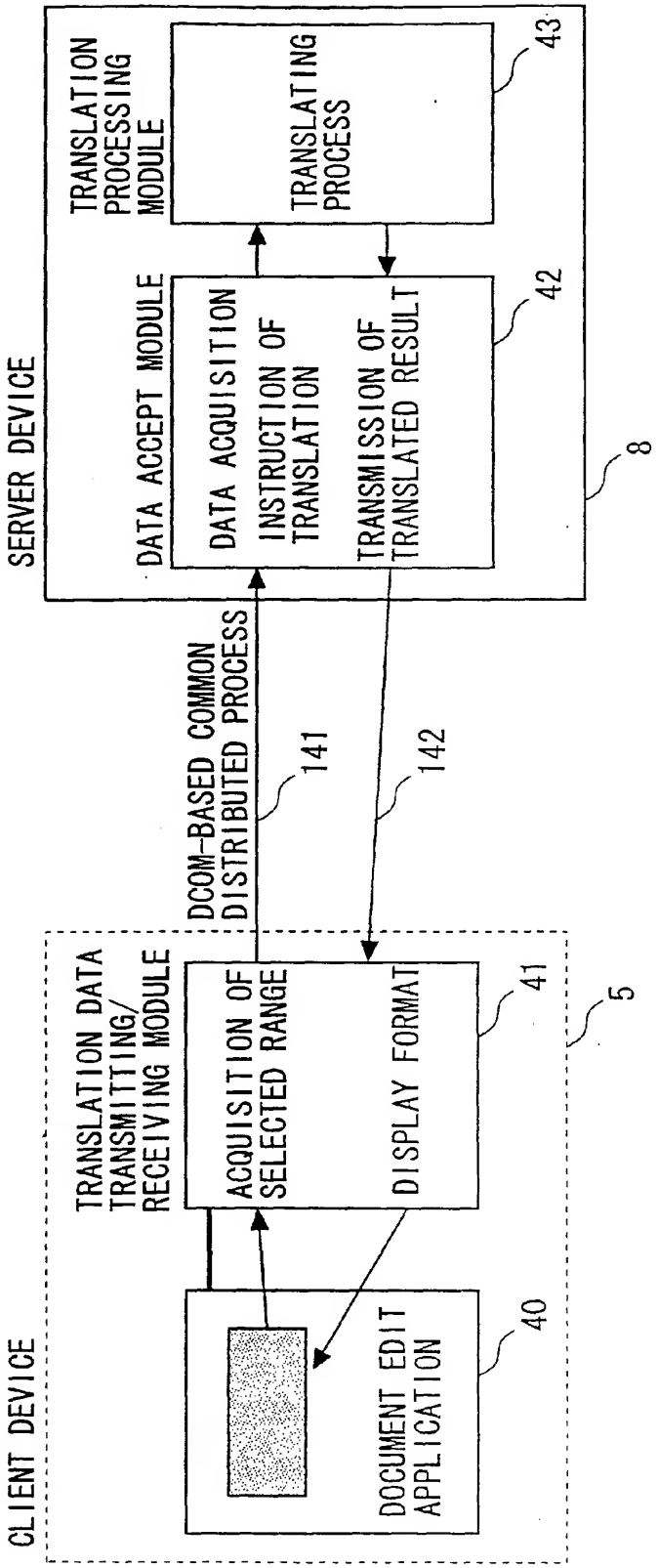

SERVER DEVICE
TRANSLATION PROCESSING MODULE
TRANSLATING PROCESS
43
DATA ACCEPT MODULE
DATA ACQUISITION
INSTRUCTION OF TRANSLATION
TRANSMISSION OF TRANSLATED RESULT
42
8
DCOM-BASED COMMON DISTRIBUTED PROCESS
141
142
CLIENT DEVICE
TRANSLATION DATA TRANSMITTING/ RECEIVING MODULE
ACQUISITION OF SELECTED RANGE
DISPLAY FORMAT
41
5
DOCUMENT EDIT APPLICATION
40

FIG. 19

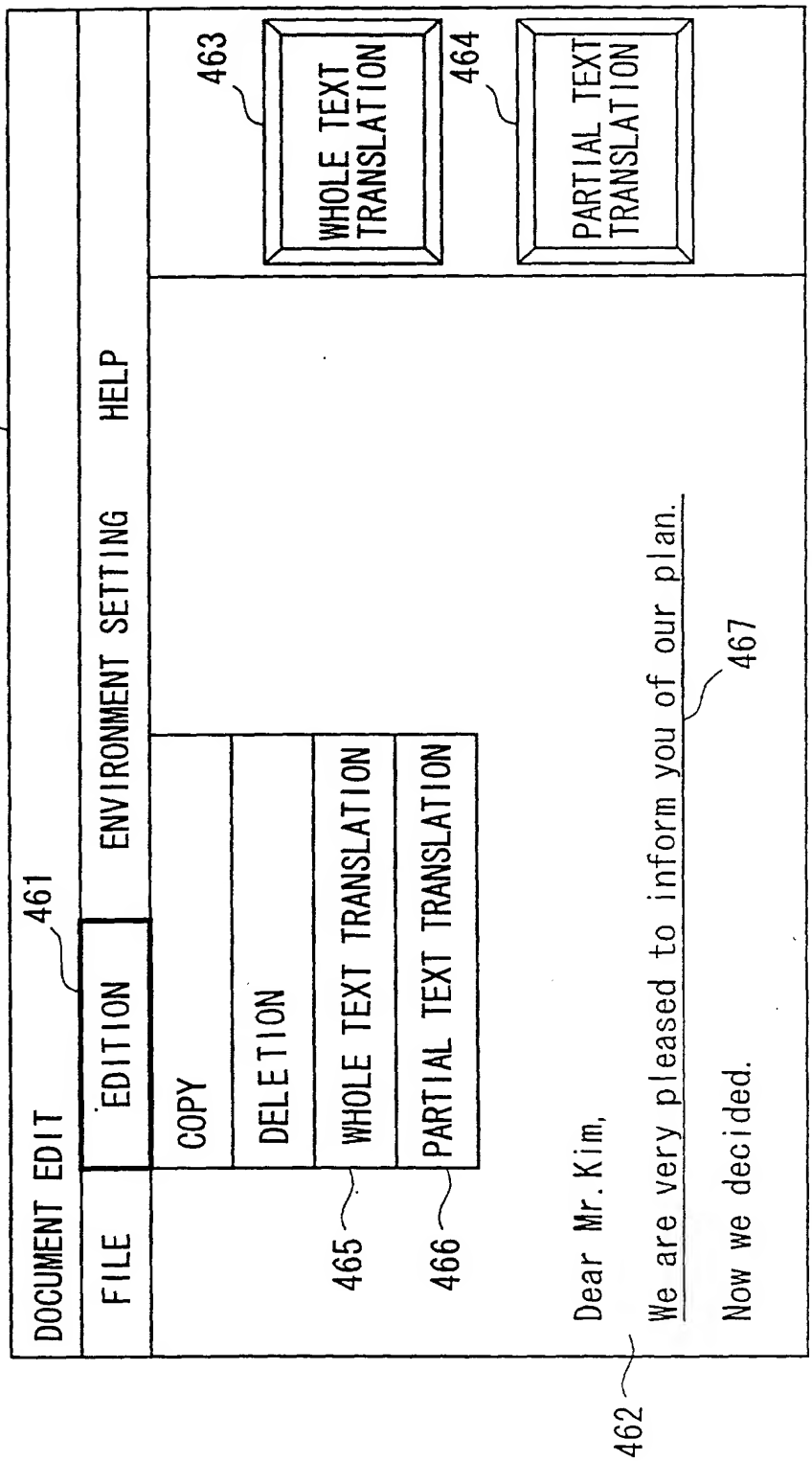

460
DOCUMENT EDIT
FILE
EDITION
461
ENVIRONMENT SETTING
HELP
COPY
DELETION
WHOLE TEXT TRANSLATION
PARTIAL TEXT TRANSLATION
465
466
463
WHOLE TEXT TRANSLATION
464
PARTIAL TEXT TRANSLATION
Dear Mr. Kim,
We are very pleased to inform you of our plan.
Now we decided.
467
462

FIG.20

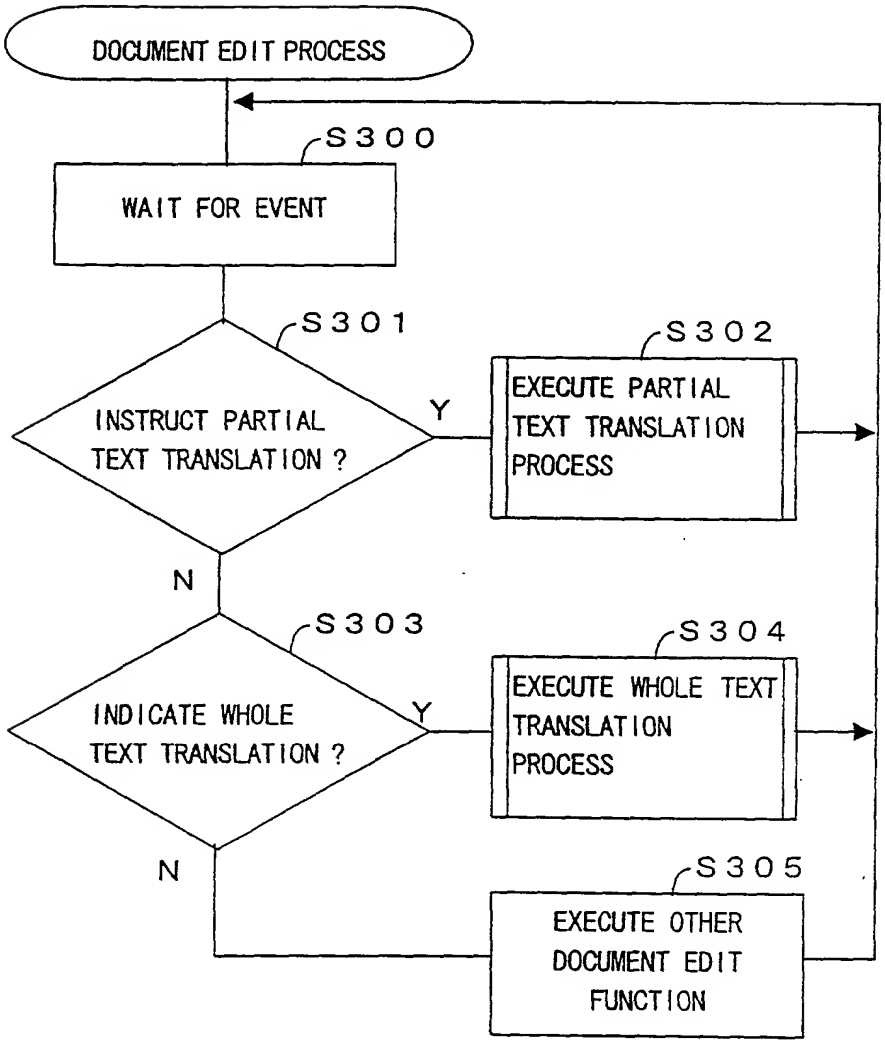

DOCUMENT EDIT PROCESS
S300
WAIT FOR EVENT
S301
INSTRUCT PARTIAL TEXT TRANSLATION ?
Y
S302
EXECUTE PARTIAL TEXT TRANSLATION PROCESS
N
S303
INDICATE WHOLE TEXT TRANSLATION ?
Y
S304
EXECUTE WHOLE TEXT TRANSLATION PROCESS
N
S305
EXECUTE OTHER DOCUMENT EDIT FUNCTION

FIG.21

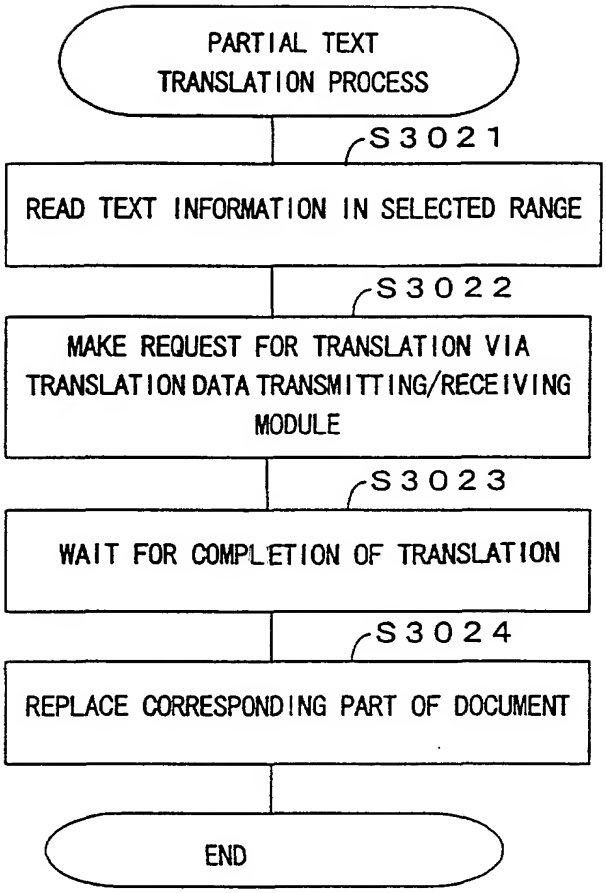
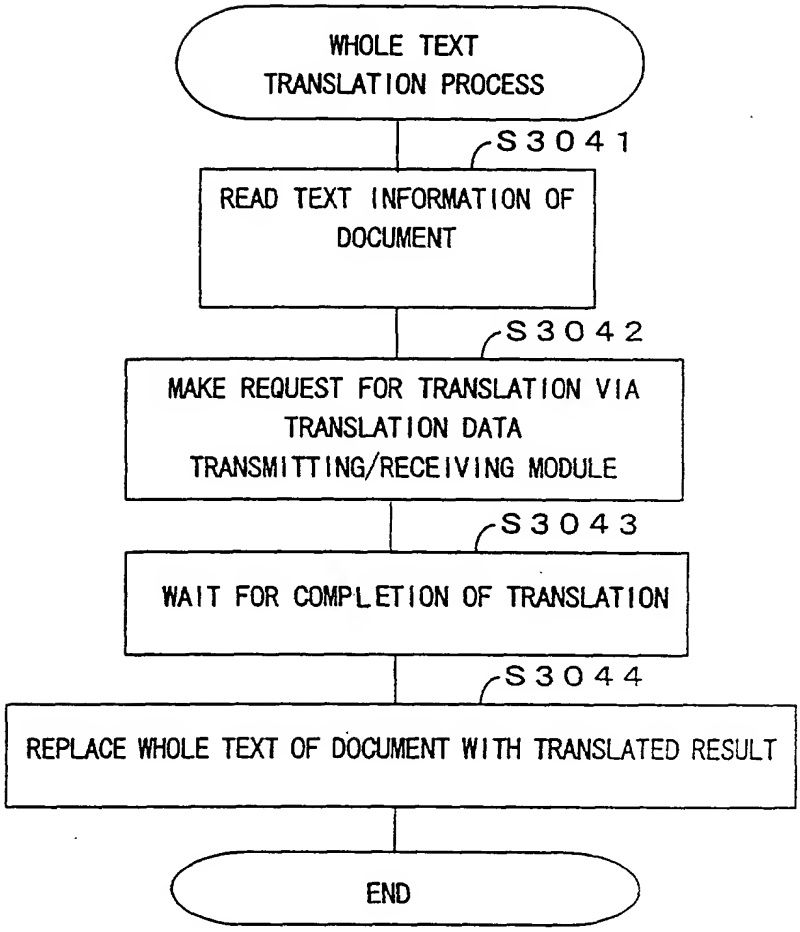

PARTIAL TEXT TRANSLATION PROCESS
S3021
READ TEXT INFORMATION IN SELECTED RANGE
S3022
MAKE REQUEST FOR TRANSLATION VIA TRANSLATION DATA TRANSMITTING/RECEIVING MODULE
S3023
WAIT FOR COMPLETION OF TRANSLATION
S3024
REPLACE CORRESPONDING PART OF DOCUMENT
END

FIG.22


WHOLE TEXT TRANSLATION PROCESS
S3041
READ TEXT INFORMATION OF DOCUMENT
S3042
MAKE REQUEST FOR TRANSLATION VIA TRANSLATION DATA TRANSMITTING/RECEIVING MODULE
S3043
WAIT FOR COMPLETION OF TRANSLATION
S3044
REPLACE WHOLE TEXT OF DOCUMENT WITH TRANSLATED RESULT
END